Telephony.

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The Testing of Dry Cells.

The use of dry cells in the past fifteen years has increased rapidly and it is estimated that there are 40,000,000 cells in use in America. This extensive use of dry cells has directed attention to the fact that there is no simple test which is generally applicable for determining their serviceability for various purposes.

A test which is commonly used to indicate the condition of a cell, is the short circuit current test. This test, however, is of use only when the tester is familiar with the brand of cell under test and knows what current may be expected from that particular make and brand. While a test of this nature may indicate the cell's condition, it should not be considered a conclusive or sufficient test.

A committee appointed by the American Electrochemical Society, to investigate methods of testing dry cells presented a preliminary report at a recent meeting of the society in Boston. The report proposes a series of tests for the various kinds of service for which dry cells are used.

It is hoped that the suggestions will lead to the adoption of a definite and universal test. The principal portions of the report will be found on other pages.

New Coinage Not a Menace.

It appears that the telephone and slot machine companies, which have been strong in their opposition to the proposed new coinage, hove nothing to fear from it, according to a dispatch from Washington. It was apprehended that the three cent pieces might be used in the pay stations and slot machines in place of either a nickel or a dime. This, it seems, will not be possible.

It is said that the first thing that the director of the mint, George H. Roberts, did, after the proposed legislation was submitted to him for opinion, was to urge that the language of the bill be so shaped that the treasury could make the coin wholly unlike, in size and design, any existing coin. The design now most favored by the treasury is much too large to enter a dime slot, too small to operate a nickel slot and possesses a scalloped edge like an Indian one anna piece.

The restoration of the three cent coinage, however, in spite of the protection afforded by its design, has aroused a fear that its existence may tend to create a demand for three cent telephone calls and three cent trolley fares.

The Power of Public Opinion.

In a recent address before the Publicity Club, of Minneapolis, Howard Elliott, president of the Northern Pacific Railway, brought out strongly the force public opinion has and may have upon almost every great problem confronting the nation today.

"I read in the Literary Digest a few days ago," he said, "four paragraphs which are said to represent the Chinese view of certain business practices. They read as follows: 'Those who deal with merchants unfairly are to be beheaded. Those who interrupt commerce are to be beheaded. Those who attempt to close the markets are to be beheaded. Those who maintain the prosperity of commerce are to be rewarded.'

"The Chinese seem to recognize that injustice, interruption of business and control of markets are undesirable things and that the expansion and growth of commerce is a good thing.

"They suggest pretty drastic remedies, which can hardly be followed out in this country and they suggest rewarding those who expand commerce; while in this country the tendency is to condemn them.

"Public opinion, however, in this country, if created wisely by the action of the true majority, can accomplish the desired results without beheading anybody."

Public opinion, declared Mr. Elliott, can insist, among other things, "that the great public service and other corporations must be fair to those who need their service, but on the other hand they must receive fair treatment and a chance to make money, or they will not be

ready to serve when the public needs them badly, and that laws shall only be made on complete knowledge of the real facts."

"To create a public opinion," he concludes, "everyone must do some work and not leave the formation of that opinion to a small minority who make a great deal of noise, not always in the wisest way, and everyone can do a little towards helping out."

On the Reading of Trade Journals.

The Inland Storekeeper, in a recent issue, commenting editorially upon the necessity of the close reading of trade journals, said in part:

> The trade journal is out to help its readers and it is anxious to know how to help them. The man behind the paper is more desirous than you realize to know what his readers want and what they like. I believe in the subscribers to any publication sending in plenty of the "Old Subscriber" and "E Pluribus Unum" kind of letters, raking the paper fore and aft when it needs it and patting it on the back when it deserves it. I believe in a man taking the same attitude in regard to his trade paper that he takes in regard to his lawn mower, his automobile and his wife; that of thinking it the very best there is. I believe in that sort of blind patriotism, that sort of loyalty to what is loyal to us.
>
> Foolish? Perhaps it is, but without more or less sentiment and foolishness even business would not be successful.
>
> The trade paper stirs a fellow up. It excites his liver and it arouses his energy. The trade paper reader does not suffer from torpid anything. He is alive and he is wise enough to see that no matter how much he already knows there is still plenty for him to learn.
>
> You remember what Louis XIV said to his priest, Father Massilon? He said, "Father, I have heard many great preachers and I have been satisfied with all of them, but as for you, you make me dissatisfied with myself."
>
> And so it is with the good trade paper. It makes the wise merchant dissatisfied with himself and it arouses in him ambitions to be and do something better and greater, to accomplish more, to win a success that shall be a real success.
>
> These trade papers need your help in making them better. They need to get first hand information as to what will make them more useful to the trade. The more you help them, the more they will be able to help you. Ask them questions. Send them complaints about their own methods or about manufacturers' methods. Ask them what they mean by sidestepping this issue or that and why they come out so strongly for something that seems to you to be foolish. Get right down to brass tacks with the trade paper and tell the editor what you think of him, because he did this or because he failed to do that.

Here is a good "hunch." This man knows what co-operation really means and appreciates that it is the best thing that can happen when the readers of his paper "start something," whether they praise or blame. That is one of the features which gave TELEPHONY its prestige in the telephone field from the start and which has maintained it there—co-operation between the paper and its readers. We think we may fairly say that very few journals occupying a specialized field sustain so intimate a relation with their subscribers as does TELEPHONY. And this is both a healthy and a pleasing condition.

The Significant Bulletin.

On the wall of the New York Telephone business office there generally hangs a large bulletin giving the increase in the number of subscribers since the first of the year, says the Wall Street Journal. This bulletin is revised each day. But the bulletin is not always there. Even the fastest train is likely to have to back up occasionally. There are naturally days when the number of stations cancelled exceeds the number of new stations installed.

Next day the bulletin is missing from the wall, because the net gain in stations is less than the number posted the previous day, and the company never advertises regress, even to its agents. But they know the significance of the missing bulletin. It means: "We are not gaining." It means dig. When the bulletin reappears with a new high record the office and agents breathe easier.

Promote—But Tell the Truth.

Promote, by all means. Promote any old project that seems good to you. That's the way we progress. But—if you do promote, tell the truth about your proposition. The consequences may be disastrous if you fail. A new era is dawning and, for the second time within a few weeks, the promoter has been adjudged by the courts to be responsible to the people who buy securities on the strength of his representations.

This time it is the Supreme Court of the United States which has upheld the principle. It has sustained a judgment against Albert S. Bigelow, of Boston, in the sum of $2,100,000, with interest, the whole aggregating probable two and a half millions. The victor in the suit is the Old Dominion Copper Mining & Smelting Co. Bigelow and Leonard Lewisohn, of New York, promoted the company, and while owning its stock, sold to it property at an enormous profit. Then they sold their stock to the "innocent public."

The company under the control of the "innocent stockholders" sued Lewisohn in New York for the profits and lost. Then it sued Bigelow in Massachusetts and the courts of that state held that the company, no longer controlled by its promoters, could rescind its contract and make Bigelow account.

Courtesy.

Courtesy is defined as politeness—civility. In the business field, however, it has a broader meaning, that of thoughtfulness of the position, feelings, comfort and convenience of others, especially towards customers and patrons of the business. Being courteous in a business not only attracts customers, but holds them. No firm or employe should be satisfied unless the firm's customers and patrons are satisfied.

Telephone Development on Chicago Great Western Railway

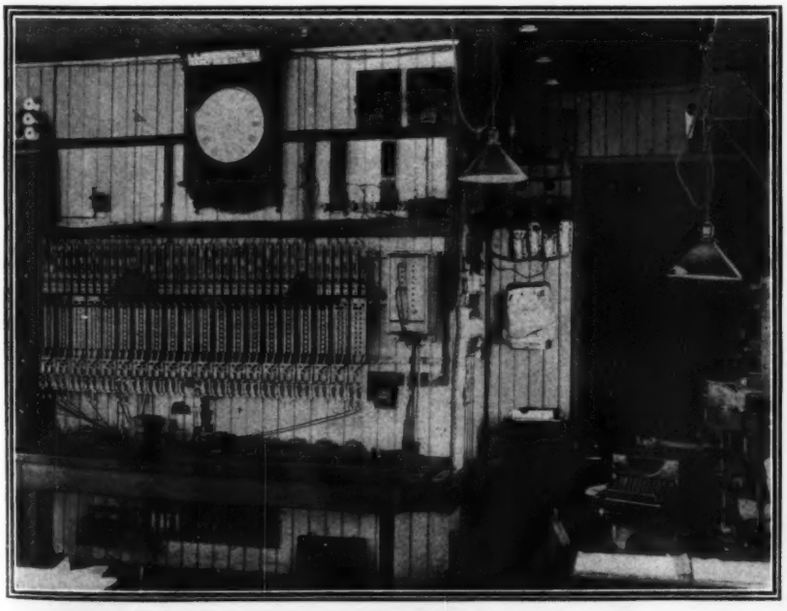
By W. L. Cook

Those who have not kept in touch for the past few years with the Chicago Great Western Railway may well be astonished at the extensive improvements made by the new management. Twelve million dollars have been spent on the roadway and for new rolling stock, and luxurious passenger trains with compartment sleepers and up to date club cars are now operated over the well ballasted roadbed which is laid throughout with new 80-pound steel rails. Three-position automatic block signals protect train movements over a considerable number of the lines, including the Chicago division, a large part of which is double-tracked.

S. M. Felton, the president, has been especially fortunate in gathering about him a splendid corps of executive officials and it is under the supervision of these men that the extensive improvements are being carried out. Among these officials is G. O. Perkins, superintendent of telegraph, who, a little less than two years ago, left the National Railways of Mexico, where he had been for ten years superintendent of telegraph, to come to the Chicago Great Western and carry out the management's plans for telephone development which form the subject of this article.

Mr. Perkins began his telegraph career on the Wabash Railroad. Going to the Santa Fe, he became train dispatcher and was later employed by the Western Union and Postal Telegraph companies in Chicago. Newspaper work appealed to him and he became chief telegraph editor of the Chicago Tribune. Later, when the United Press came into prominence as a news-gathering organization, he became its night manager at Chicago and afterward superintendent of news service.

In 1901 Mr. Perkins went to Mexico as superintendent of telegraph of the Mexican Central Railway, taking charge afterwards of the telegraph and electrical department of the National Railways of Mexico. From that position he returned in 1910 to the United States as superintendent of telegraph of the Chicago Great Western Railway.



Telegraph Switchboard and Telephone Test Board in the East Stockton Office.

A. T. Hollenbeck, assistant superintendent of telegraph, who has been associated with the Chicago Great Western for many years, has borne an important part in the improvements which have been made. He began telegraphing on the lines of the North American Telegraph Co. and has been associated with the Chicago Great Western since 1890.

The Dispatcher's Headquarters At East Stockton.

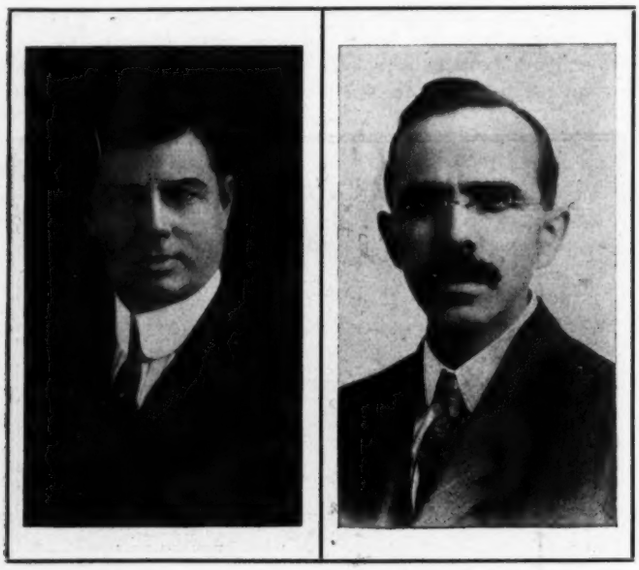
The important Chicago division, embracing 246 miles of trunk line between Chicago and Oelwein, Iowa, has been thoroughly equipped for telephone operation. East Stockton, Illinois, 130 miles west of Chicago, where large yards and repair shops are located, has been made dispatchers' headquarters with telephone train dispatching circuits extending in both direction to the division terminals. The dispatching circuits are paralleled by local message telephone circuits on which the routine business of the division is handled.

The telephone train order circuit from East Stockton to Chicago, consists of two No. 9 B. & S. gage copper wires, transposed every half mile. They extend as far as Chicago Transfer, 123 miles from East Stockton, which is the end of the aerial line. The remaining 7 miles into Chicago is of No. 16 gage paper insulated cable. There are in all, 35 way train order offices on the circuit and each is equipped with a main line bell type Gill selector on which the dispatcher may call the way offices in 6 seconds. Kellog telephones mounted on Burns' arms are used at the way offices and the telephone transmission, using what is known as the booster transmission circuit, is most efficient. The transmitters are of the well known Kellogg type in which the carbon electrodes are retained in a cup of which the diaphragm forms a part.

The way station head receivers are provided with circular magnets which are not subject to demagnetization. The receiver caps are reinforced with metal to prevent breakage as are the transmitter mouthpieces.

The method of attaching receiver cords to the head receivers is worthy of mention. The cord terminals are slipped into two holes in the rubber case in which the

terminals are entirely concealed and are held in place by two exposed binding screws which are flush with the back of the case. This simple arrangement admits of changing receiver cords by unskilled employes without danger of injury to the receivers and without the decrease in receiver efficiency which would result if it were necessary to remove the diaphragm in order to attach the cord.



G. O. Perkins. A. T. Hollenbeck.

The local message telephone circuit which parallels the dispatcher's circuit is bridged into each of the offices. Double pole, double throw switches are provided on the operators' tables to permit using the way office telephones on both the train order and message circuits. A Gill selector having the same combination number as the dispatcher's selector is associated with the message circuit at the various offices. The line wires for both circuits are brought into the offices on No. 14 twisted pair, outside distributing wire, terminating on knife switches which are wired so that either selector may be connected to either line in emergencies, or the entire equipment may be disconnected from the lines for test.

The way station selector outfits are each equipped with a Universal resistance to facilitate balancing the selector bridges, so that each station will get its proper proportion of signaling current. The Universal resistances are so adjusted that each selector is normally operated on eight milliamperes. It has been found, in actual service, that the circuit operates satisfactorily with nearly 50 per cent. of the signaling battery exhausted, showing a wide margin in the operation of the selectors and in the ringing of the main line bells. Lighting arresters of the air gap type are installed on both circuits inside the line switches so as to be disconnected from the line when the switches are opened for test.

The message circuit is composed of two No. 8 iron wires transposed every half mile. All joints have been soldered and every precaution has been taken to make the transmission as efficient as possible. The booster transmission circuit employed on the telephones, admits of forcing the transmitter battery to the limit for use on the iron circuit. This is possible because the excessive transmission can be choked out of near stations by the sliding core retardation coil wired in series with the receiver, at the same time allowing the maximum voice current to go over the high resistance line to the most distant stations. Retardation coils of 3,000 ohms resistance, having high impedance to voice currents, are wired in series with the message selectors as a further aid to through transmission.

The message circuit consists of iron wires from East Stockton to Chicago Transfer and from there runs into Chicago on No. 16 gage cable. The telephone transmission between Chicago and East Stockton on this long iron circuit is entirely satisfactory and great credit is due Mr. Perkins and his aids for obtaining satisfactory message telephone service over a No. 8 iron circuit of this length.

Owing to the high resistance of the iron wires, a relay battery for operating the selectors is located near the middle of each of the message circuits to avoid using an excessively high voltage line signaling battery. The photograph of the Dubuque office shows one of the signaling equipments mounted.

Test offices are located approximately 20 miles apart and switch panels are provided which permit the opening of the lines at the various test offices or patching in a section of iron wire to make good the dispatcher's copper circuit in case of line trouble. The selectors have sufficient margin to allow of patching in the iron circuit without interfering with the service. At Dubuque and Sycamore, where the relay signaling batteries are located on the message circuits, the patching panels are so arranged that the relay signaling batteries may be operated on either circuit, as desired, whenever the wires are patched.

The equipment at the dispatcher's office consists of Gill keyboards with silent individual keys and Kellogg aluminum breastplate transmitters. Master signaling equipments for both the east and west end dispatchers' circuits and for the paralleling message circuits are located in one building at East Stockton. Storage batteries are used for supplying the dispatchers' and message operators' transmitters. A wire chief's test panel, provided with suitable instruments, enables J. R. Eberhart, the senior wire chief, to locate trouble on the telephone lines quickly and to check the conditions of the signaling and transmitter batteries. The dispatchers' equipment is protected with the air gap lightning arresters of the same type used at the way offices and in addition, a number of vacuum lightning arresters are used to reduce the disturbance in the dispatchers' receivers.

Dispatcher's Table At East Stockton, Showing Calling Keys.

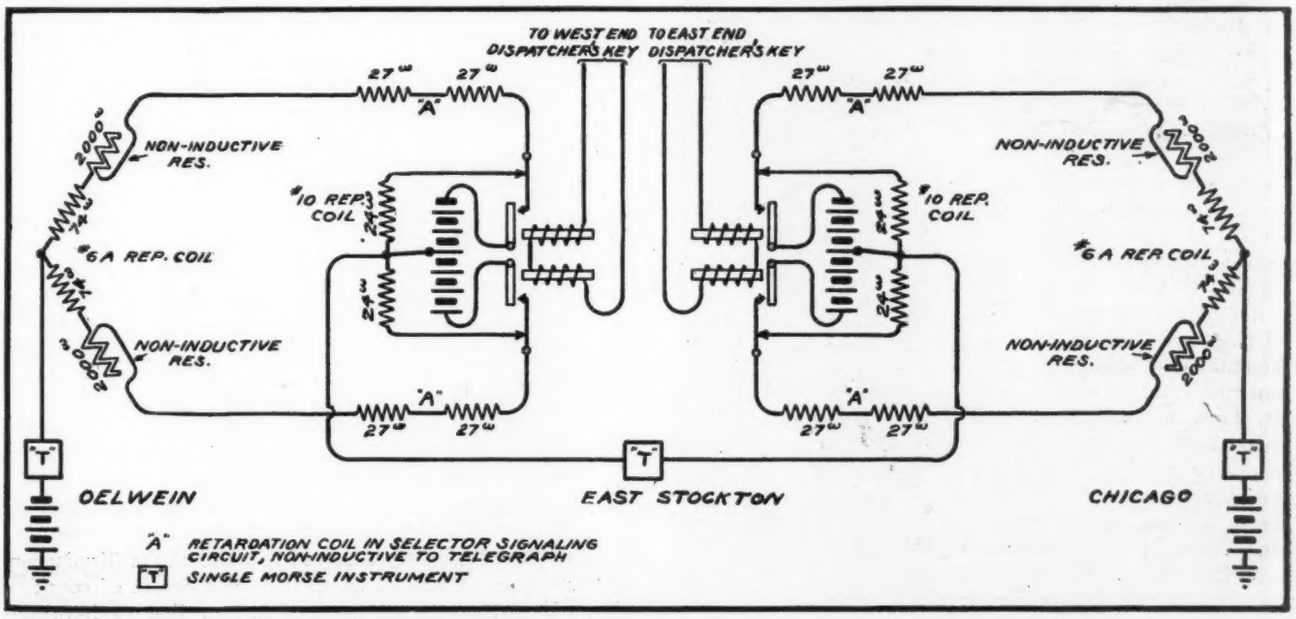
The west end dispatchers operate from East Stockton west to Oelwein, Iowa, 116 miles. The line circuit consists

of two No. 9 B. & S. gage copper wires, transposed every half-mile throughout the entire circuit and is paralleled by a message circuit consisting of two No. 8 iron wires transposed every half mile, alternating with the copper wires on quarter mile poles. Both the message and dispatchers' circuits are cut in at 27 way offices and the station equipment is similar to that used on the east end of the division.

Emergency telephones are installed in the waiting rooms of all telegraph offices which are closed a part of the day to give the train crews access to the telephone when the train-order office is closed. Mr. Perkins has also placed telephones in shelter boxes at the ends of passing tracks to enable train crews to save a few minutes by communicating with the dispatcher direct, when ready to leave, instead of requiring them to return to the train order office.

A double throw knife switch enables employes to use the emergency telephone on either the dispatchers' or message circuits. Track men, signal men, bridge men and other employes who carry switch keys, use the emergency territory during the severe winter weather. The telephones are used in connection with Sandwich line poles which are designed so as to be readily attached to a pair of wires, regardless of their relative location on the pole line. In the past, complaints have been made that line poles, when connected to copper wires, break the skin of the hard drawn copper, resulting in numerous breaks in the line wires. The new Sandwich pole has been designed with a view to overcoming this defect and its use on the Chicago Great Western has proven that satisfactory line pole connections can be made without the slightest injury to the copper wires.

In addition to using the pair of copper wires for telephone train dispatching, a simplex telegraph circuit is operated over the wires throughout the entire division with single Morse offices cut in at Chicago, Chicago Transfer, East Stockton and Oelwein. The Fry method of simplexing, shown in the accompanying circuit diagram, is used. The Fry simplex connections eliminate high resistance in Morse telegraph circuit at the dispatchers' offices, mak-



The Circuit Connections for the Fry Method of Simplexing Used On the Chicago Great Western Railway.

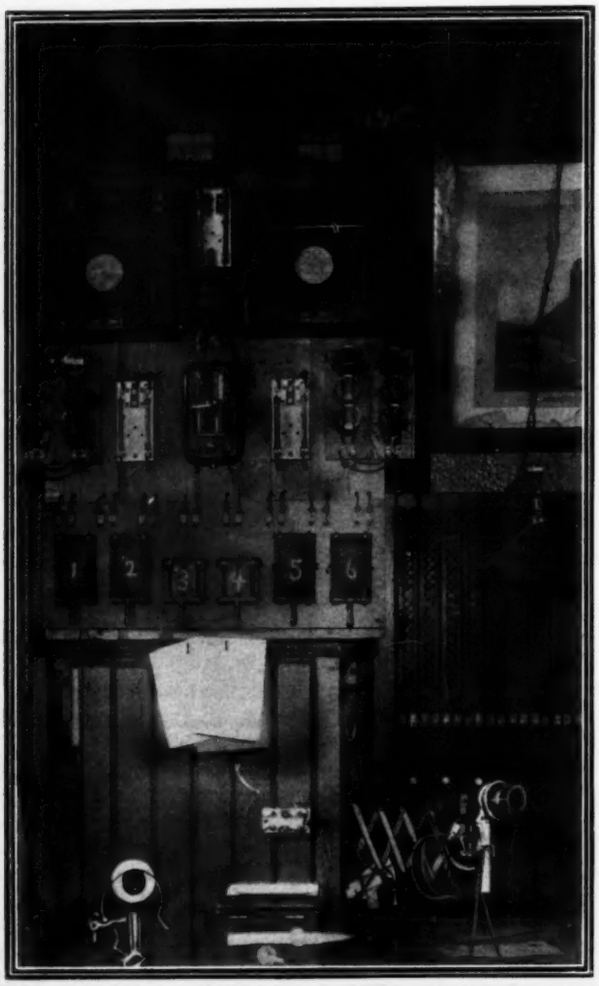
telephones for interchanging information with the dispatcher and for communicating with their division officials over the message circuit.

Wherever emergency train orders are to be taken at booth telephones, train order registers are installed. The registers contains quadruplicate order forms always ready for use. Three copies of the order are delivered to the conductor when he operates the register and the fourth copy remains in the register on the record roll, inaccessible to the train crew. The register solves the problem of keeping the emergency telephones supplied with suitable order forms at all times but its most important function is the careful systematic method of taking orders which must be practiced by the train crews where registers are used. The critics of telephone dispatching have for years centered their attack upon what they claimed was the careless method of taking orders practiced by the train crews at the emergency telephones. The use of the register requires the conductor to make a careful painstaking copy of the order as the record roll is inspected at regular intervals by the proper official.

Portable telephones carried on all passenger trains, as well as by emergency and bridge gangs, have proven invaluable, especially in flagging blocks in automatic block ing telegraph service possible over the two districts. The 2,000 ohm non-inductive resistances at Oelwein and Chicago are required on account of main line bell ringing and are not ordinarily used in Fry simplexes over Gill selector circuits.

This pair of copper wires is also used for a third telephone circuit for conversation and messages between Chicago and Oelwein, a distance of 246 miles. The second circuit on the copper wires may be called a grounded phantom. It is comparatively free from noise, due to a new system of electrically tuning the receiving circuit which shunts the telegraph disturbance around the receiver, and at the same time sends the voice currents through the receiver with only a slight loss due to the receiver shunt. This combination has resulted in a grounded telephone circuit between Chicago and Oelwein, over a distance of 246 miles. It is exposed to heavy telegraph induction, but unusually clear transmission is obtained on it. The importance of communication by the grounded phantom described, between the general offices at Chicago and the division headquarters at Oelwein, will be better understood when it is known that at Oelwein not only the main shops are located, but trains arriving from Chicago, divide there for Minneapolis, Omaha and Kansas City.

The superintendent of the Chicago division, J. A. Gordon, and his assistant, T. A. Sweeney, make their headquarters at Chicago and find the message telephone a great convenience for communication with their aids, I. E. Palmer, trainmaster, and E. W. Fowler, chief dispatcher at East Stockton. Mr. Fowler's force in the dispatching service



The Test Board At the Dubuque Station.

includes W. H. Chase, night chief dispatcher; L. B. Fiske, J. A. Swingle and J. O. Fisher, first, second and third trick dispatchers operating the telephone circuit, East Stockton to Chicago, and G. A. Rossbach, J. J. Green and F. E. Lawrence, trick dispatchers on the west end circuit.

The entire equipment including selectors, telephones, lightning arresters, train order registers, wire chief's test panel and storage batteries for operating dispatchers' transmitters, was supplied by the United States Electric Co., of New York and Chicago. The quadruplicate train order register is a feature in train dispatching equipment which is rapidly coming into general use, having been used for a number of years on the Union Pacific and Illinois Central and by nearly all of the large traction lines.

As is the case with most of the roads which have installed telephone train dispatching, there are few exact figures which can be cited to show the efficiency and economy of the system on the Chicago Great Western. There has been a great improvement as a result of the plans and expenditures of the new management. Even ascribing a large part of this as due to better track conditions, better motive power, automatic block signals and other causes, the officers state that it cannot be questioned that the improved communication brought about by telephone train dispatching and message service has benefited all operating conditions and reduced expenses by accelerating train movements and by bringing the yard masters and the chief dispatchers into closer and more economical intercourse. One concrete example of the resulting economies is that last winter but two sets of train dispatchers were employed on the Chicago division against three sets in previous winters, a saving of over $400 per month on the pay roll.

Upper Michigan Railroad to Use Telephone Dispatching.

It is reported from Cadillac, Mich., that the day is not far distant when the Grand Rapids and Indiana Railroad will abolish telegraph train dispatching service on its Missaukee and Traverse City branches.

The success of the telephone system of train dispatching that has been attained by the Pere Marquette Railroad has been closely studied by the G. R. & I. officials and has been found satisfactory.

At the present time telephone dispatching is used between Kingsley and Walton Junction, Bond Mill and Manton, and M. O. Siding and North Yards. This service is satisfactory and it would need but a small outlay of equipment to complete the circuit through from Traverse City to Cadillac. The change on the Missaukee county branch is said to be slated for this year.

Indianapolis, Railway Telephone Dispatching Center.

In connection with the dispatching of trains by telephone, a great amount of telephone equipment has been installed in railroad offices in various cities.

It is said that Indianapolis, Indiana, has more selectors and telephones for railway dispatching than any other city in the world. There are 82 selector stations in service within the city limits. They are located upon the several divisions of the Big Four Route; L. E. & W.; C. H. & D.; Indianapolis Union Railway; Indianapolis Belt Railway, and the Stock Yards Co. Every train, freight and passenger, entering or leaving the city is governed in its movements by telephone.

Another Southern Railroad to Install Telephone System.

Installation of a telephone system for train dispatching, instead of the telegraph system, will be made on the Birmingham & Southeastern Railroad, which is now in course of construction. This road is the latest Southern line to have this system installed. Several railroads operating into Birmingham, Ala., now have the telephone in use. The Southern, Alabama Great Southern and Seaboard Air Line railways have under consideration the adoption of the telephone to replace the telegraph for dispatching trains.

The division of the road between Union Springs and Eclectic, Ala., will be fitted up at once with the new system.

D. & H. Railroad to Install Telephones in New Shops.

Arrangements are under way on the part of the Delaware & Hudson Railroad Co. to install a private telephone system at the new locomotive and car shops under construction at Watervliet, N. Y. The system will consist of an exchange in the central office with telephones in all the other buildings. About 25 subscribers' stations will be installed.

To Connect Havana With the States.

From Havana comes the information that telephone communication will soon be established between that city and Key West, Fla. The company contemplating the venture, after a thorough investigation, has decided that it is entirely possible to perfect a telephone system from Havana to Key West by cable, which would put Havana in direct touch with the cities of this country.

Features of Railway Telegraph Superintendents' Meet

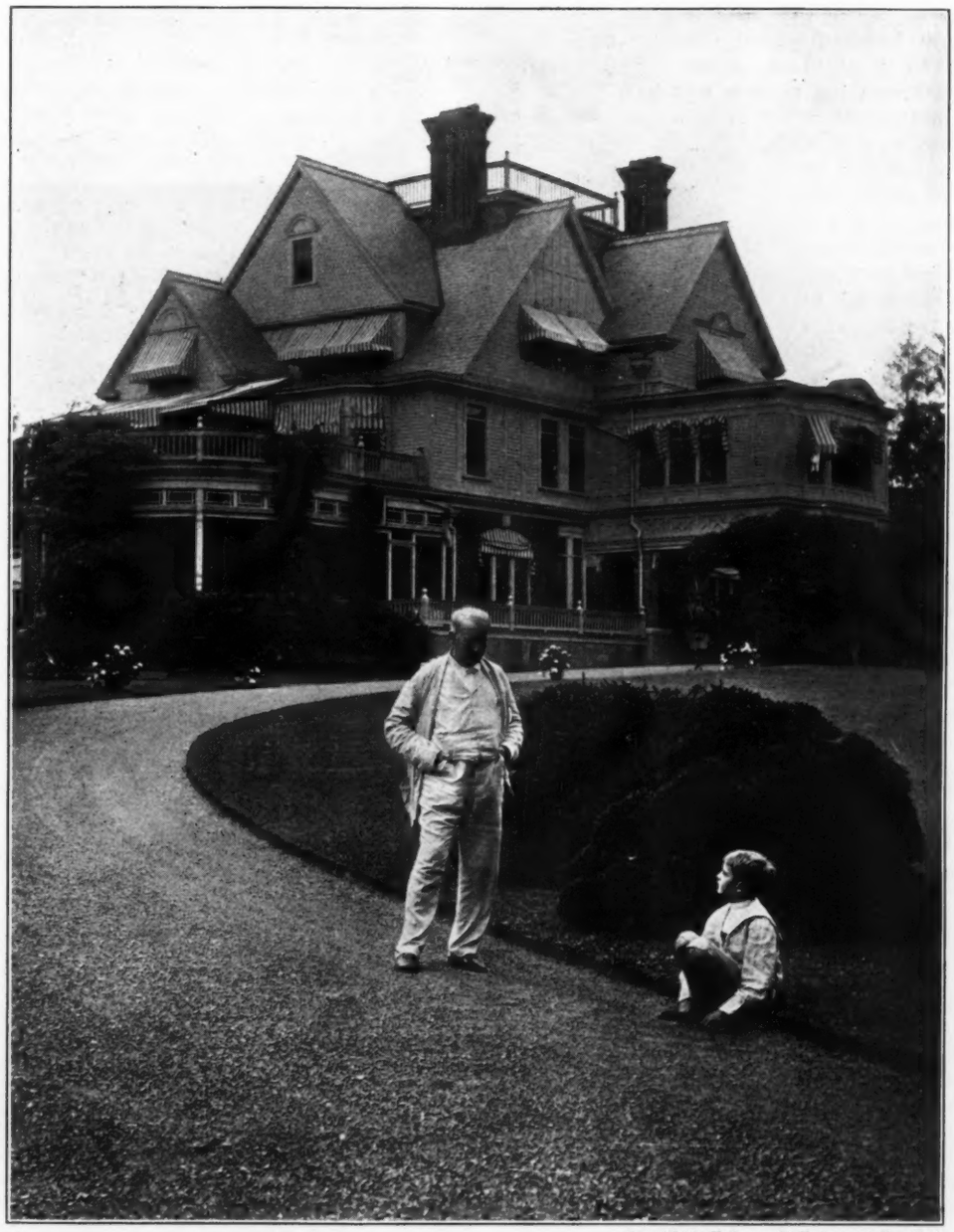
Annual Convention at New York City Next Week—Telephone Problems to Be Given Particular Attention Because of Wide Extension of Telephone Train Dispatching—Inspection Trip to Edison's Laboratories to Be Big Feature of Meeting

Next week the Association of Railway Telegraph Superintendents will hold its annual convention at the Waldorf-Astoria Hotel, New York. The annual convention of this association is an event which, for thirty years, has been productive of many improvements in railway telegraph service.

A glance over the printed proceedings shows a wide diversity of subjects discussed, but all having to do with the building, operation and maintenance of railway telegraph and telephone service. During the past few years, superintendents of telegraph have been called upon to take up the telephone as a prominent factor in their field and each year an increasing number of papers are presented, dealing with various phases of telephone work, as applied to railway operations.

The organization of the railway telegraph superintendents was formed in Chicago, November 20, 1882, for the improvement of railway telegraph service; its scope being later extended to include telephone dispatching systems. Its annual conventions have been held in many of the large cities from Boston to Los Angeles, and from Montreal to New Orleans.

In the list of honorary members are the names of many men who have been prominent in the development of the telegraph and telephone, among them being Thomas A. Edison. Mr. Edison has taken a great interest in the annual gatherings of the association and has been present at some of its meetings. This year as the meeting is held so near his home and laboratories, Mr. Edison insisted upon being host to the association for an entire day. Accordingly, a day has been set aside on which all those in attendance at the convention will journey to West Orange, N. J., which is about 10 miles from New York, for a visit to Mr. Edison's laboratory and work shops.



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Home of Thos. A. Edison at Menlo Park—Mr. Edison and His Youngest Son, Charles.

The time will be spent in an inspection of the laboratory and factory of the famous inventor, where doubtless many of his inventions will be demonstrated. The visit should prove most interesting, as in these laboratories are employed many skillful electrical and mechanical engineers as well as chemists and other experts who work out Mr. Edison's ideas and carry out experiments under his directions.

The interest Mr. Edison takes in the association dates back many years. Older members of the association remember a paper on "Insulation," which Mr. Edison prepared for the Denver meeting back in 1892. At that time

insulation was not regarded as it now is and the paper proved of great value in pointing out many of the insulation faults of that period.

It was while attending one of the conventions held at Wilmington, Del., also, that Mr. Edison was coaxed into making one of his few public speeches, as he is decidedly opposed to them. On that occasion he had refused to address the convention, but arrangements had been made for him to appear before the school children of the city, so that they could get a glimpse of the man about whom they had heard so much for many years.

Mr. Edison had consented to this and stated that he would respond by bowing his acknowledgments, but when the time came, there were several hundred school children present and the sight of them calling for him to speak, overcame his reserve and he made an impromptu speech which is still remembered by those who were fortunate enough to hear it. Many of those in attendance at that convention were not present at the school meeting having no idea that Mr. Edison could be induced to speak and they have regretted it ever since. It was pronounced one of the best speeches which he ever has delivered in public.

One of the interesting inventions of Mr. Edison which was used to some extent by the railroads, was the phonoplex. Its use permitted secret messages to be sent over the telegraph lines between division officers as the operators at way stations were unable to read the message on this phantom circuit.

The Soo Line, of which Secretary P. W. Drew is superintendent of telegraph, had the phonoplex system in use for many years. When the telephone was introduced for dispatching purposes the phonoplex was displaced by it. In this connection, it is interesting to note that Mr. Edison also was the inventor of the carbon telephone transmitter, the principle of which is used in transmitters of the present day.

Their annual convention is not the only time at which the telegraph superintendents get together for the interchange of ideas. The association has been divided into two divisions, the eastern division and the western division; the demarcation being the dividing line between Eastern and Central time. Two meetings of each division are supposed to be held during the year, but during the past year largely attended joint meetings were held in November and March at Chicago.

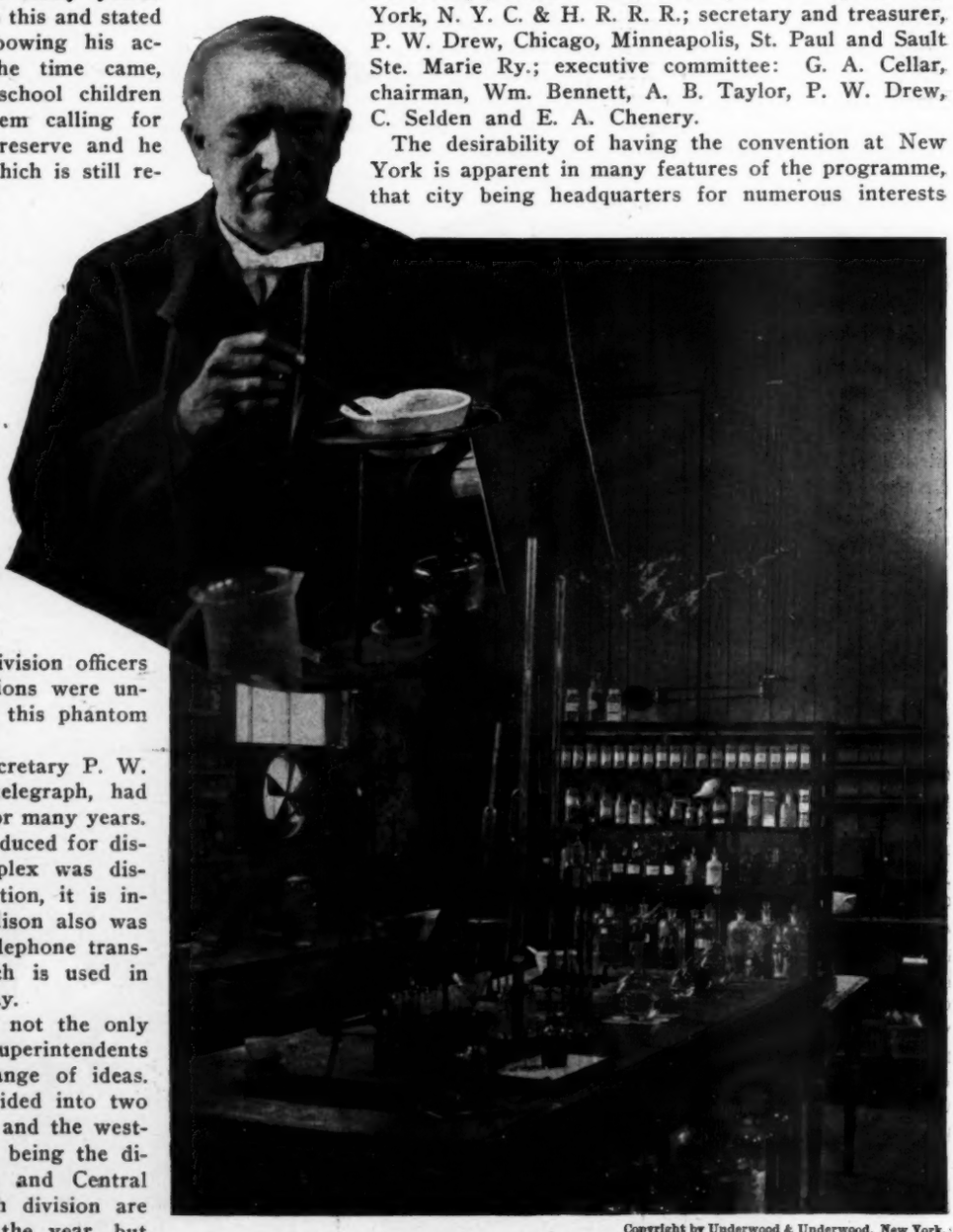
The advantages of the telephone over the telegraph for train dispatching are numerous, and the question of the time and money saved by use of the telephone is one which has been discussed at various meetings.

Since the passage of the sixteen hour law, which provides that no train crew shall work more than sixteen hours at a stretch, innumerable delays have been avoided. Trains may be held up on a siding within a few miles of the end of the run at the moment when the sixteen hours limit expires. Under the old regime of telegraph dispatching, such trains would be abandoned, but by use of portable telephone sets, the waits at various sidings now can be cut down, and in many cases the trains run to division points before the time limit is up. It is practically impossible to estimate the saving effected in cases of this kind, but it is known to be a considerable amount.

The officers of the association are: President, G. A. Cellar, Pittsburgh, Pa., Pennsylvania Lines—west of Pittsburgh; first vice-president, Wm. Bennett, Chicago, C. & N. W. Ry.; second vice-president, A. B. Taylor, New York, N. Y. C. & H. R. R. R.; secretary and treasurer, P. W. Drew, Chicago, Minneapolis, St. Paul and Sault Ste. Marie Ry.; executive committee: G. A. Cellar, chairman, Wm. Bennett, A. B. Taylor, P. W. Drew, C. Selden and E. A. Chenery.

The desirability of having the convention at New York is apparent in many features of the programme, that city being headquarters for numerous interests which are closely associated with the superintendents' association. New York is headquarters for The Telegraph & Telephone Age, the organization's official journal, which was founded over 30 years ago by John B. Taltavall, and is still ably conducted by Mr. Taltavall and his brother, T. R. Taltavall.

New York also is headquarters for the American Telephone & Telegraph Co., the Western Electric Co., and the Western Union Telegraph Co. which, being jointly owned, have jointly undertaken a large part of the entertainment.



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The Wizard of Menlo Park and a Corner of His Laboratory.

The Postal Telegraph Co. also has its central offices in Manhattan, so that for these reasons as well as because of the sight seeing facilities and exceptional accommodations of every other description, the delegates and visitors anticipate one of the most successful sessions in the organization's history.

The reception at the Waldorf, the water trip to Coney Island, the theatre party and the all-day inspection trip to the Edison works at West Orange are sure to be memorable features of an eventful week.

On top of all this, the Association of Railway Telegraph Superintendents is noted for the transaction of a great deal of important business in a very thorough manner, and this year's meeting promises to be no exception.

One Telephone System

Des Moines Difficulties—A City Sick of Its Bargain—The So-Called Double Burden Misnomer, Etc.

By J. C. Kelsey

It is to laugh!

The Des Moines, Iowa, newspapers have made a discovery—single telephone service is a failure!

Newspapers generally are funny.

Most of them preach high tariff on all products but wood pulp.

On wood pulp there should be no tariff. Of course not, it makes paper high!

Some time ago, the Des Moines papers were unanimously decided on one telephone service.

They fell for the usual bunk.

And decided that two telephone systems were a great inconvenience to the public.

They decided, in some mysterious way, that the public was noisily declaring against the dual service.

Further, that one telephone system would do away with the horror of duplication, make securities higher in value and stronger in character.

Also that the law should protect the public from the extortion of dual service.

In other words—the world was literally pining away for the joys of single service.

Even the children in their trundle beds moaned at night, over the evils of the deadly dual service.

Surely Utopia was temporarily close!

But last week I read in a Des Moines paper that "all that glitters is not gold."

Here are some of the startling defects of a single and universal service.

Truly a pretty picture of a completed merger, and some of its beatific results:

I. Delay in getting central.

II. Premature disconnection of connected subscribers.

III. Getting the wrong number.

IV. Discourtesy.

Strange that this beautiful dream of one telephone system should pan out so badly, when there are others shivering and hesitating on the brink of a plunge.

Going into details, we learn the following:

I. That bad service in Des Moines comes from poor equipment, or from bad mechanical causes.

II. Carelessness and inefficiency of the operating department.

III. Company pays low salaries and can not hire the girls.

Can it be possible that this situation is a logical result of one telephone system, the one great universal and interdependent ideal?

Yes, gentle reader, it really is!

And besides these gross charges, it surely does make the Des Moines newspapers sore to be charged extra because they do not walk up to the window and pay their telephone bill before the tenth.

Why not give the Des Moines papers special privileges? It is a wise management that keeps the papers in line.

As long as they get enough advertising, they will advocate three telephone systems.

The lesson of the telephone has not been learned yet—it is beyond newspapers.

The theory of the double burden will yet be exploded—it is on a false basis.

The whole weakness of the argument lies in the real absence of duplication.

In no city in America does the duplication exceed 15 per cent. It is nearer 12 per cent., and even 10 per cent.

Business houses now alone carry this so-called "double burden."

They need two telephones anyway.

So the burden of a single telephone service may give the 15 per cent. minority some doubtful relief, while the 85 per cent. majority carry the load against their wishes, too.

There is little or no duplication in the residence districts.

And they are to carry the burden—hence the inevitable future trouble, because economy always begins at home.

There never was such a ridiculous claim as the one that the public is demanding single service.

The single service demand always comes from a prejudiced place, not from the public itself.

And when single service is given, how is the duplicate burden gotten rid of? It is not "ridden."

In the New York gas case, the court gives power to add the cost of a purchased competing rival to your own capital account. You never lose it.

And when it is all said and done, and single service is a fact, you take away the principal forces of benefit to the public—those which compel service and courtesy.

The only courtesy you get from a railroad or any corporation or an individual, is when there is close competition.

Actually, I hope the citizens and newspapers of Des Moines get all they bargained for!

That hope will be realized.

Human nature has not changed.

The same spark which made the early Bell monopolists contemptible is still existent.

The same spark is in the Independent monopoly bosom, too.

I have seen some Independent telephone monopolies which would shame the most autocratic czar.

And the success of the Bell company in making connecting contracts with 2,800,000 Independent telephones is entirely due to the blind arrogance or indifference of some of the larger Independent concerns.

I remember the first man in Indiana to take the Bell lines on his board did so because he got a much better deal from them than he could get from the Independent company.

There is no monopoly or fancied advantage of any sort that will not literally spoil the human beneficiary of it.

That explains why the Des Moines situation is so bad.

When competition existed, both companies courteously tried to collect their accounts.

And when put off by some excuse, each company collector forced patience to the front, because it was policy to do so.

And it has come to pass that the people of Des Moines have been spoiled.

When competition ceased to exist, then did patience cease to be a virtue.

The collector no longer had policy whispering "patience and caution" in his ear, and he became impatient.

He wanted his money and wanted it without too much expense.

So the company tacked on the 25 cents forfeiture clause. It ought to be 50 cents, and enforced, too.

And when competition ceased to exist in Des Moines to please newspapers and the clamoring (?) public, speed also ceased to exist as a policy factor.

Hence charge number one delay in getting central.

No other company can get the call, why should the Iowa Bell company crowd the switchboard with operators?

It costs too much money!

Let the "easy marks" of Des Moines take their turn.

That is what they do at the post-office.

And I have waited quite a while for a street car, too.

You remember how the man explained his lack of enthusiasm and affection for his wife after he married her.

He said, a man after running for a suburban train and catching it, does not keep on running. He goes in and sits down.

And so the Iowa Telephone Co. of Des Moines has quit running. They have found a seat and are resting.

Do not blame the Iowa telephone.

Blame Des Moines, because it was so forgetful of human nature that it made the mistake.

The telephone company has made no mistake—it is merely taking real advantage of a city's foolish generosity.

Let the Des Moines people also remember, that if the old Mutual company had the monopoly, they would be crying about the same evils.

When competition ceased to exist in Des Moines, then the necessity of keen service became a memory.

The supervisors became fewer in number—the operators got less help.

And they became careless about disturbing connections. Consequently, a man in Des Moines today, is not sure of a finished or uninterrupted talk.

Monopoly does not affect the officials of a company in even a small degree, as it does the minor employes.

Officials are intelligent enough to see the effects of abuse.

Employes are not so careful, because they have not learned the economic lesson.

The girls, themselves, relaxed the very hour that competition ceased to exist.

They ceased to run, too. They had caught the train of single service, and sat down in a seat to rest.

You can't get away from this fact.

No human being will carry his full load unless initiative coaxes him to go forward, and dire necessity compels him from behind.

The Iowa Telephone Co. is just as human as its employes are.

The expression "soulless corporation" is merely a bogie. A corporation is just as soulless as its officials, and is just as merciful, too.

When Des Moines was granted her dearest wish of single telephone service, the necessity of getting the right number no longer compelled the operator.

Nor did pride or initiative.

Had not the Bell company reached its goal of single service? Why not go in and find a seat on the train?

It certainly would cause comment if you ran excitedly up and down the aisle of the train.

Calmly seat yourself!

When Des Moines went into a peaceful sleep and listened to the serpent, the necessity of courtesy was also lost.

Why be courteous when you do not have to?

Did you ever notice how you treat a man after you discover he is selling goods himself, not buying?

Ask any salesman!

I think the Des Moines people and papers deserve all they get.

They selected the present situation, with eyes open, drums beating and colors flying.

They have no kick coming!

And no other city will have any kick coming when they forget themselves so far as to believe that the lion no longer prefers meat, and the wolf will no longer eat a lamb!

It is dangerous to trust to human nature.

Only a few centuries ago, people fought each other with clubs,

And burned and buried people who did not believe as they did.

Civilization is only a veneer, so thin that the primeval man can still be seen underneath.

If the people of Des Moines turned the animals of a circus loose, they would not be surprised if children were torn to pieces and eaten.

Why are they surprised when they turn over a telephone monopoly to a group of human beings?

Des Moines is expecting too much.

That city made its bed and now objects to lying in it.

Looks like poor sportsmanship!

Before Des Moines looked back upon early telephone days of single service, as Lot's wife looked back upon the good times of Sodom and Gomorrah, we all heard a great deal about superior equipment.

Today we learn in sorrow that Iowa Bell telephone can not give good service because of poor equipment.

Is it practically impossible to expect the truth these days?

Is it beyond our hopes to think that monopoly will yet feel the force of evolution, reforming its character and improving its apparatus?

Like the leopard, monopoly has no power over the changing of its spots.

As far as I am concerned, I can't see why the Bell company ever wanted to get rid of the Mutual company in Des Moines.

One would think that the Bell crowd would prefer a feeble competition to the doubtful joys of monopoly.

But no one can ever analyze Bell "thinks" any more than he can learn what goes on beyond the grave.

Mere size has covered up many errors, but there is an end.

What goes up will come down.

I know Wall Street well enough to believe that they will yet demand their pound of Bell flesh.

One can find no sympathy for the plight of Des Moines.

I hope they keep right on cutting off connections, slowly answering calls, and being impudent.

Do not worry, they will! Monopoly knows no other behavior!

I believe the telephone business is really beginning.

All these fourteen years of probationary fighting are not going to be lost.

The conditions at Baltimore, Des Moines, Albany, Syracuse, Seattle, Tacoma and other points are but temporary.

No human power can stay the storm which will yet rage around these centers.

I saw a clipping, which, of course, was written in the East.

It said—"Independent telephony is not as strong today as it was ten years ago."

In some senses, this is true.

No promoter stalks about, making bad promises and giving bad notes.

So-called "Independent telephony" is stronger today than ever.

Instead of "Independent telephony," I am going to say that the open telephone business is better today than ever.

I am sick of the words "Bell" and "Independent." Both are disgusting!

Both have undergone some disagreeable experiences.

The question is, will anyone profit from the experience?

I don't believe so, because human memory is so short.

It is a sure thing that Des Moines memory is very abbreviated!

MORAL.—Does anyone remember the Maine?

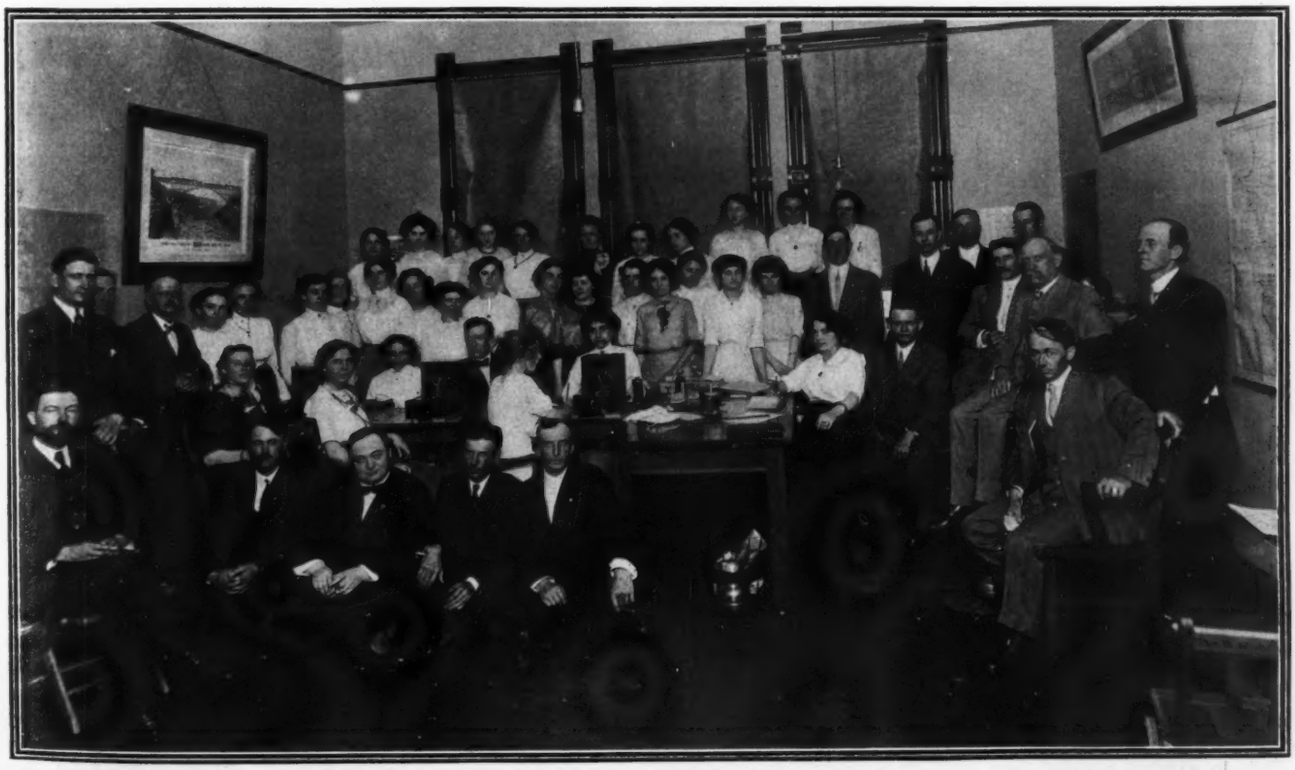
First Annual Meeting of Illinois Clearing House Held

Stockholders in Independent Toll Clearing Co. Meet at Springfield to Discuss Past Year's Accomplishments—Fred A. Dolph Announces Early Reorganization of Aurora Inter-State—Members Endorse Kelsey's Postal Article—Toll Operators School

Two features which marked the meeting, at Springfield, last week, of the Independent Toll Clearing Co., the clearing house for the Independent telephone companies of Illinois, were the declaration of Fred A. Dolph, receiver for the Inter-State Independent Telephone & Telegraph Co., of Aurora, that that organization would soon be reorganized and would remain Independent of Bell control; and the resolution applauding Mr. Kelsey's recent article in TELEPHONY regarding Postal Telegraph inactivity.

This was the first annual meeting of the members of the clearing house and it was well attended, representatives of about thirty stockholders being present, as well as thirty-five toll operators from various parts of the state. The latter came to the meeting to attend the school for toll operators conducted by W. S. Vivian, of Grand Rapids, Mich., secretary and manager of the clearing house in that state. Dr. J. W. Collins, of Decatur, vice-president of the Illinois organization, presided, in the absence of Mr. Dolph, the president, who was ill and unable to attend.

During the meeting a letter was read from Mr. Dolph, in which he expressed his complete satisfaction with the operations of the Toll Clearing Co. and stated that he was prepared to continue to co-operate in every way possible. In this letter he also made the announcement regarding



Members of Illinois Toll Clearing Co. and Toll Operators Who Attended Annual Meeting and School.

the Inter-State which is mentioned on the previous page.

A discussion was had the first evening on the new Illinois workmen's compensation law, upon which subject C. G. Alexander, of Chicago, spoke from the view-point of an insurance man. Several Illinois managers have already elected to operate under the provisions of the law.

On the second day, Mr. Vivian showed the toll operators in attendance how they could become saleswomen of long-distance service instead of mere connection-makers. Three Kellogg demonstrating toll switchboards were used to illustrate the points brought out.

Mr. Vivian also spoke at the morning clearing house session on the things the Michigan organization had learned in its eight years of experience. He urged the adoption of ideas which it was observed, result in a cross between a railroad traffic association and a bank clearing house. He also took the place of Miss T. Anne Barnes, of Bloomington, and addressed the young ladies on the subject of how the operator may make herself of more value to employers and patrons.

Charles R. Peel, of the Inter-State company, described the new Illinois lines, telling of the numerous extensions and rebuilding operations which have been carried on throughout the state.

Two of the resolutions adopted were as follows:

"Resolved, That we read with pleasure J. C. Kelsey's article in TELEPHONY criticizing the do-nothing attitude of the Postal Telegraph Co. and sincerely hope that he will continue his efforts until he pushes them off the fence on one side or the other."

"Resolved, That we earnestly endorse and commend the action of Fred A. Dolph, of the Inter-State Independent Telephone & Telegraph Co. for the efforts he has made in preserving to the Independent telephone interests in Illinois the integrity of his company and for whatever efforts he may, in the future be constrained to make."

Other resolutions thanked Mr. Vivian for his instructive and forceful talks and school for operators, and Ed. D. Glandon and H. B. Gilmore manager of the clearing house, for their work in systematizing the business. The resolutions further urged that steps be taken to place the clearing house in line for greater benefits to all Independent companies and that all members co-operate to improve the organization.

The stockholders elected the following to serve on the board of directors: One year, L. F. Hyneman, Lexington; two years, E. D. Boynton, Pleasant Plains; three years, W. S. Fisher, Kankakee; W. W. Holliday, Jacksonville; A. F. Loehr, Carlinville; T. C. Ainsworth, Bloomington, and S. W. Tracy, Chicago

The following officers were re-elected: President, Fred A. Dolph, Aurora; vice-president, J. W. Collins, Decatur; treasurer, Ed. D. Glandon, Pittsfield. H. B. Gilmore, of Springfield, was elected secretary and was also re-appointed manager of the clearing house.

In the operators' school the girls who actually worked with each other were at the boards. For instance, Springfield switched calls between Auburn and Peoria, or Bloomington was the intermediary for Clinton and Joliet. When these girls duplicated their daily performances, the questions and cross-fire of testimonials from other operators showed an absence of uniformity which wasted time.

The point which impressed itself most plainly upon the operators and the attending managers, was the folly of "fighting for the line." Mr. Vivian showed the cost to managers of such service, how it robbed the operators of the pleasure of work well done and made toll work a trial. He spoke of the responsibility resting upon them and how it was possible for them to gradually bring their smaller neighbors into the uniformity fold.

In continuing his delineation of operators as saleswomen he covered the easily apparent points of courtesy, study of the scope and history of the Independent telephone movement and the application of common-sense, judiciously mixed with rules, to local conditions. This he supplemented by openings for an operator, neglected by most exchanges. Under the present plan of operating smaller Illinois Independent companies this revenue assumes almost the nature of a by-product. Pertinent suggestions were: Do not give the calling party too much information. That is, do not tell John Jones, at Decatur, who is calling Henry Smith, at Bloomington, that Mr. Smith has left for Danville. Ask him if he wants you to call Mr. Smith wherever you can find him, or if he will talk to anybody else. Perhaps the information that Mr. Smith has left for Danville is all he wanted. To illustrate this the story was told of a druggist in a small town who called every morning for James Perkins employed by an ice cream factory in a nearby city. The ice cream company always replied that it could locate no such person in its employ. Finally the telephone company found that the call was a code for, "Ship me five gallons of ice cream."

Overtime messages should be nourished. Do not break into a conversation with an abrupt "Time." The question of handling overtime messages from depot and hotel pay stations was brought up by an operator. It was the opinion that this could be handled by watching the board closely calling attention to the overtime when the conversation is over and asking that more money be deposited.

Even if there is an occasional loss by this method the travelers are heavy toll users, and it would be better to lose the money than that the Independent lines lose favor.

Mr. Vivian made a plea for the time-stamping device. Any office doing a toll business of $50 a month loses without one. This brought out the subject of allowing operators to check back the messages. Mr. Vivian cited the process:

Operator A. "What time did you have on that message?"

Operator B. "Seven minutes."

A. "Why, I've only got four!"

B. "Well then let's make it four."

A. "All right."

"The lowest figure is always accepted," declared Mr. Vivian "and the company pays the bill."

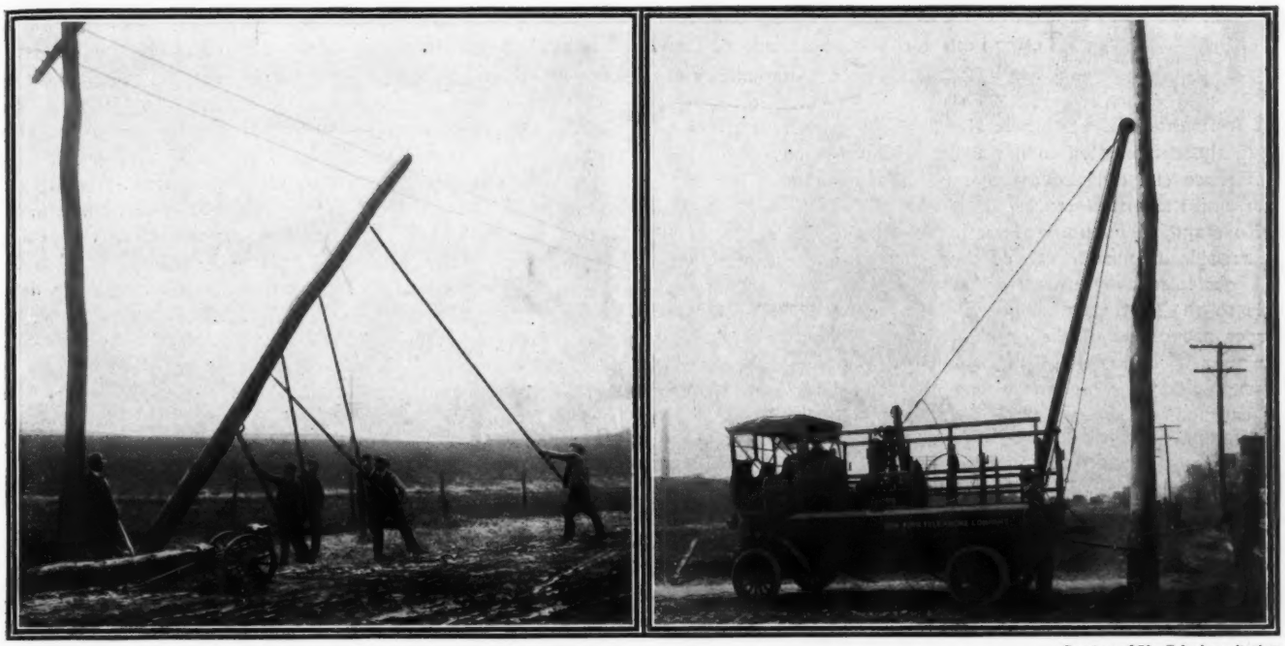
Painting the drops was found a good method for calling an operator's attention to trouble with a particular subscriber. If complaint had been made of "wrong numbers" the drop was colored red. Every time the operator plugged in the jack, she was reminded of the subscriber's grievance real or fancied. Other colors were used for other troubles and after the operator had given special attention to these for several days, the traffic department called the subscriber and if service was satisfactory, the drops were cleaned.

The work along the line of uniformity in all things pertaining to traffic and the consequent increase of revenues has just begun. Mr. Gilmore will devote a great deal of attention to following up the work begun at this school and in his trips about the state will conduct a campaign for system.

Omaha Independent to be Sold July 1.

Lysle I. Abbott, receiver, acting as special master for the federal court will sell all of the property of the Independent Telephone Co., of Omaha, Neb., with its franchises, in Omaha, South Omaha and Florence, to the highest bidder at public auction at noon on July 1. No bid of less than $1,000,000 will be considered. Each bid must be accompanied by $100,000 in cash or certified check, has a guarantee that the purchase will be completed if the bid is accepted. This is the result of foreclosure proceedings brought in behalf of the bondholders by the Title Insurance & Trust Co. The proceedings are purely formal, the company having been in the receiver's hands for some time.

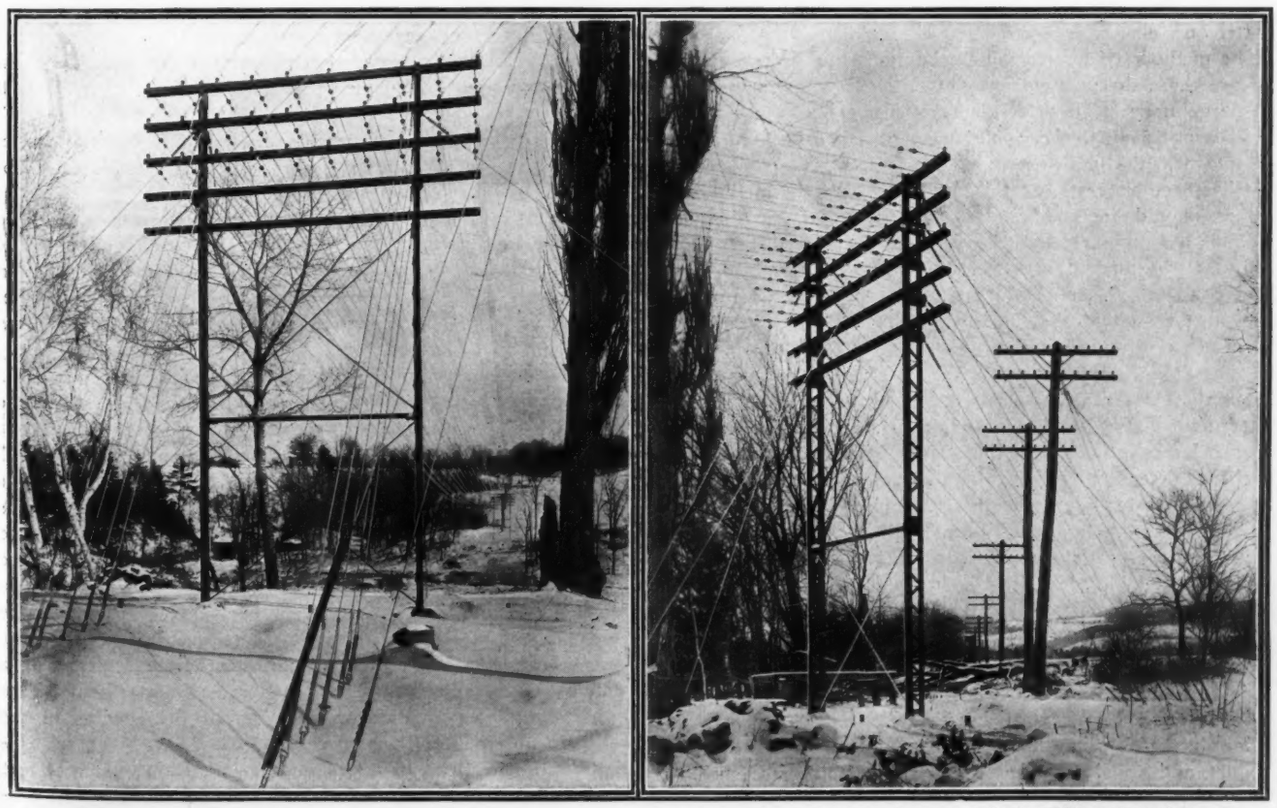
Illustrations of Interest to Telephone Men



Courtesy of The Telephone Review

A STUDY IN POLE ERECTION EFFICIENCY—THE OLD METHOD OF SETTING POLES AND THE LATEST SYSTEM.

The Setting of a Pole by Man Power Requires Six or Eight Men Working from Ten to Twenty Minutes, if the Time Occupied in Moving the Tools to the Next Pole is Included—By the New Method of Using the Automobile Truck, the Engine of which Operates a Winch, Two Men and the Chauffeur Can Erect Thirty and Forty-Foot Poles, without Appreciable Physical Effort, at the Rate of One Every Three to Five Minutes, Including the Time Taken in Moving to the Next Pole—Compared with this Way of Erecting Poles, the Men Setting Poles by the Old Method Work at Approximately Thirty Per Cent. Efficiency—If the Automobile Truck is with Construction Gang, the Cost of Erecting as Few as Two Poles is Reduced Sixty Per Cent—A Good Argument for the New Method.



Courtesy of New England Telephone T.

A LONG SPAN RIVER CROSSING OVER THE CONNECTICUT RIVER, NEAR CLAREMONT JUNCTION, NEW HAMPSHIRE.

The View on the Left Shows the Telephone Lead Crossing the Connecticut River and the Steel Towers on the Vermont and New Hampshire Sides of the River—The Tower in the Foreground is Located Near the Edge on the Vermont Bank of the River—The Illustration on Right Shows the Angle Between the Steel Structure and the Main Pole Line on the Vermont Side.

Standard Methods Recommended for Testing of Dry Cells*

The Three Kinds of Dry Cell Tests—Determining the Condition of Cells Before Use—The Reasons for a Capacity Test—Tests for Various Kinds of Service—The Rate of Deterioration on Open Circuit—Adaptability of Tests to Needs of Consumer

The methods of testing in the first place must be of benefit to those interested in dry cells. The users may be divided into three classes: the average ultimate consumer, the large user, and the manufacturer.

No standard methods of testing can be devised, which will be suitable at once for all of these classes, and the most serious obstacles are encountered in formulating methods suitable to the first class. This is unfortunate, since by far the larger proportion of the dry cell output is so distributed that the user is interested in one, two, six, or perhaps twelve cells as supplying his yearly requirements. This very large number of users should have a test, the cost and labor of conducting which should not be out of proportion to the low values of the articles tested. There appears to be no adequate means of meeting this urgent demand for simplicity of equipment and method.

The large users of dry cells, such as telephone exchanges, engine manufacturers, installers of alarm and signal devices, railroads, etc., who purchase cells in large quantities, are especially interested in testing methods. Various methods of testing have been evolved by these users as a basis for purchase specifications and as a means of judging the relative merits of the various makes of cells on the market. To them the matter of elaborateness of tests is of less importance than to the small user.

Of even greater importance is the testing of dry cells by the manufacturer, who must necessarily adopt methods which will give him the necessary information concerning his product, no matter how elaborate.

The methods of testing which the committee is recommending are those that are particularly suited to the second class—the large users. These tests, if extensively adopted, will be of indirect benefit to the small consumer, and will be of mutual advantage to the large users and manufacturers.

It has been suggested to this committee that the methods for testing should include, aside from electrical measurement, methods of physical and chemical analysis, such that judgment may be made thereby of the merits of a cell, and that what constitutes a satisfactory product should be described in these terms so that they might form a basis of specification. There is a striking similarity between the various cells on the market as far as materials used and general structure are the market as far as materials used and general structure are concerned. Exceedingly slight variations, however, which introduce large variations in the quality of the product, are not capable of detection by physical and chemical examination. What is of even greater importance in determining the quality are the methods of assembling, such as methods of mixing, grading as to size, of the particles which constitute the cell mixture, and methods of tamping, factors which cannot be easily determined by physical or chemical inspection of the resultant product.

The art of dry cell manufacture cannot be considered as having been worked out to a finality; improvements are being made and will continue to be made. One maker may discover a simple method of neutralizing the effects of an impurity on his product which may have a detrimental influence in another product, and a judgment based upon the detection of such impurity would thereby work an injustice. The tests, therefore, should be such as determine the ability of the cell to produce results, and these can be determined only by tests involving electrical measurement.

The dry cell, in all of its multitudinous uses, is merely a source of electrical energy, and its ability to deliver this energy, in the quantity and at the times desired, constitutes the principal measure of value.

Dry cell tests may be conveniently divided into three main groups.

1. Tests to determine whether or not a cell is in good condition before being placed in service.
2. Tests to determine the actual or comparative service capacity of cells.
3. Tests to determine the rate of deterioration of cells on open circuit.

Tests of Cell Condition Before Use.

The electromotive force, short-circuit current and internal resistance tests are used, to determine the condition of a cell before use.

Electromotive force.—The electromotive force of a cell may be read by connecting a voltmeter directly across the terminals. In new cells of various types the electromotive force may vary from 1.5 to 1.6 volts. If a cell of the type now in general use gives an electromotive force less than 1.45 volts it is an almost certain indication either of serious deterioration due to age, or of the external short-circuiting of the cell, or of some defect such as an internal short-circuit ,which will soon render the cell unfit for service.

It is seldom necessary to measure the open-circuit voltage of cells, since they are seldom deficient in this respect. It is a test which may be considered as secondary in nature, and should be applied when it is suspected that the cells are below standard, for example, when cells are received with wet packets, when the terminals are corroded, when the electrolyte leaks from under the seal, or when the cells are abnormally low in short-circuit current.

An accurate or carefully calibrated voltmeter should be used, the resistance of which is sufficiently high to render the current flow through it inappreciable. A two-scale Weston instrument of 300 ohms resistance with 3-volt maximum deflection and 1,500 ohms with 15 volts maximum deflection has been found very satisfactory for both cells and batteries. Cheap pocket instruments are often so inaccurate as to make their indications of open-circuit voltage worse than useless. The effect of temperature on electromotive force is very slight.

Short-circuit Current.—The short-circuit current of a cell may be obtained by connecting an ammeter directly across the terminals of the cell. The short-circuit current of a cell is of value only when coupled with a familiarity with the brand of cell in question. If the reading is normal for that brand of cell, it is reasonably certain that the particular cell is in good condition, and that it will probably give as good service as others of the same make. This applies only to cells of the same brand and make. That the short-circuit current of a cell of a new and unfamiliar brand is as high as that of another brand is no indication whatever of the equality of the service capacities of the two cells.

The short-circuit current bears no relationship to service, and when measured without reference to temperature or other conditions may be entirely meaningless and misleading.

The ammeter for reading short-circuit current should be deadbeat, and with its leads should have a resistance of 0.01 ohm, to within 0.002 ohm. Two 30-inch lengths of No. 12

*Part of a report by the committee on dry cell tests of the American Electrochemical Society.

lamp cord make very convenient leads. The maximum swing of the needle should be taken as the short-circuit current of the cell. The ammeter should be connected across the brass terminals of the electrodes. Low readings are likely to be obtained if the ammeter is applied to the carbon electrode directly. In order to avoid high contact resistance, the terminals of the cells and of the ammeter leads should be brightened.

It has been found very convenient to fit the ammeter leads with small terminals of lead. The contact on the cell terminals is greatly improved, and with such leads it is unnecessary to brighten the contacts. For accurate measurement of the short-circuit current of a new cell, instruments of the pocket type should be avoided.

The effect of temperature on the short-circuit current is quite pronounced. The amperage of cells is raised about one ampere for each 10 degrees centigrade rise in temperature. This value varies considerably with different cells, and is somewhat greater at the lower temperature and less at the higher. At very low temperatures the effect is very pronounced, and it is often noted that cells received in extremely cold weather read but one or two amperes. On bringing them to room temperature however, the short-circuit becomes normal and the cell is not impaired by the freezing.

Internal Resistance.—This value is usually determined by applying the formula

$$R=(V—V')/C$$

where V is the open-circuit voltage of the cell, V' the closed-circuit voltage, and C the current to which the cell is subjected in order to make the determination. The value obtained varies with the current flowing, the age of the cell, and the temperature.

For these reasons we advise against the use of this test. It indicates nothing in regard to the service capacity, nor does it gives an exact value of the actual internal resistance of the cell.

Service Capacity Tests.

In general there are but two reasons for desiring a service test upon dry cells: First, to ascertain what life may be obtained from a brand of cells in a certain service; second, to ascertain which one of several brands will give the longest life in that particular service.

With the former object in view, the knowledge is best obtained by actual use of the cells in connection with the appliance. In some cases this is one only feasible way in which the definite information sought can be obtained. The great majority of tests are carried on, however, with the second object in view.

Where the amount of testing is large, it is impossible, even were it expedient, to use the actual appliances for testing cells, and it becomes necessary to devise special testing methods and apparatus such that results obtained therefrom shall be comparable to the results obtained from the cells when placed in actual service.

It has been suggested that cells of various makes be tested by connecting them in series and discharging them simultaneously through any suitable resistance, thereby assuring that the cells are discharged at the same rate and under identical conditions. There are several objections to this method and we therefore advise against the testing of cells in this manner.

In interpreting the results obtained from a test of various grades of cells, we wish to caution against drawing definite conclusions from the outcome of a single test or of a small number of tests. When the matter of choosing a brand is of much importance, it is necessary to run a series of tests over a period of six months or a year. In this way a very good idea may be obtained of the average service results which may be expected.

Service Tests Recommended.

Telephone Service.—Discharge three cells, connected in series, through 20 ohms resistance for a period of two minutes, each hour, during 24 hours per day and seven days per week, until the closed-circuit voltage of the battery at the end of a period of contact falls to 2.8 volts.

The following readings are taken:

1. Initial open-circuit voltage of the battery.
2. Initial closed-circuit voltage of the battery.
3. Closed-circuit voltage at the end of the first discharge period.
4. Closed-circuit voltage at the end of a discharge period after three days, and weekly thereafter.

Report the results as the number of days during which the closed-circuit voltage remains above the limiting value of 2.8 volts.

Ignition Service.—Discharge six cells connected in series through 16 ohms resistance for two periods of one hour each per day, seven days per week. The periods should be eleven hours apart, but in cases where the circuits are not automatically controlled; the first and the last hour in the working day may be chosen for the discharge periods and the discharge omitted on Sunday, without materially affecting the results.

The following readings are taken:

1. The initial open-circuit voltage and short-circuit current of the battery.
2. The initial closed-circuit or working voltage, and the initial impulse of current which the battery is capable of forcing through a 0.5-ohm coil connected in series with an ammeter, and in parallel with the 16-ohm coil.
3. Closed-circuit voltage and impulse current through the 0.5-ohm coil at the end of the first period of closure, at the end of the sixth period, at the end of the twelfth period and after every twelfth period thereafter.

The test is considered completed when the impulse current at the end of a period falls below four amperes. Report the results as the number of hours of actual discharge to the limiting value of impulse current.

Particular care should be taken to keep the temperature of ignition test batteries as nearly constant as possible, as the service obtainable is greatly influenced by this factor.

Flash-light Batteries.—Discharge the battery to be tested through a resistance of four ohms for every cell in series (eight ohms for a two-cell battery and 12 ohms for a three-cell battery), for a period of five minutes once each day until the closed-circuit voltage at the end of a discharge period falls to 0.75 volt per cell (1.5 volts for a two-cell and 2.25 volts for a three-cell battery).

The following readings are taken:

1. Initial open-circuit voltage and short-circuit current.
2. Initial closed-circuit, or working voltage.
3. Closed-circuit voltage at the end of the first, third and seventh periods of closure, and after each seventh period thereafter.

Report the results as the number of minutes during which the battery was discharged through the resistance to the given end point.

In case the circuits are not operated mechanically, the results are not materially changed if the batteries are discharged only on working days. Four ohms per cell is chosen for the resistance in circuit, since the tungsten bulbs generally used with a three-cell battery have a resistance of approximately 12 ohms.

Miscellaneous Service.—In addition to the telephone and ignition services, which are by far the most important services, ignition services, which are by far the most important services among which may be mentioned the operation of automobile horns, sewing-machine motors, small fans, toys, massage vibrators, cigar lighters, bells, buzzers, etc. In the aggregate these miscellaneous services consume enormous numbers of cells, but they are so numerous, and there are such variable conditions prevailing in each kind of service, that it would be

useless to attempt to develop standard tests covering them.

It is not difficult for anyone particularly interested in any special service to arrange a suitable test for himself. Care should be taken to make the conditions of test, viz., number of cells, resistance in circuit, period of drain, etc., approximate those of the service in question.

RATE OF DETERIORATION ON OPEN CIRCUIT.

The voltage and short-circuit current of the cells for test are read initially in order to insure that the cells are in good condition. The cells are then stored in a dry place or normal room temperature.

The following readings are taken:

1. Initial voltage and short-circuit current.
2. Short-circuit current at the end of four weeks, eight weeks and each eight weeks thereafter.
3. Voltage at the end of six months.

The cells are kept on the shelf until the short-circuit current has fallen below 10 amperes. This point is arbitrarily chosen, as it represents a point below which it would be difficult to market the cell. For practical purposes, the results are expressed as the number of months during which the short-circuit current remains above this cut-off point. Much more meaning, however, it attached to the rate at which the current falls, generally reported as the drop in amperage for a given period expressed as a percentage of the initial amperage. This is especially true when investigation of the quality of cells is the object. For practical purposes, however, the first rating given, i. e., months to 10 amperes, is perhaps preferable.

The results from this test are largely indicative of increase in internal resistance, and bear no definite relation to the service which the cells may give. However, this information, coupled with familiarity with a brand of cells, becomes a very good indication of its quality. It also serves to indicate any serious defects of manufacture.

The ammeter for reading short-circuit current should be deadbeat, and with its leads should have a resistance of 0.01 ohm. Particular attention should be given to the temperature at which cells are stored, as the rate of deterioration is influenced to a marked degree by the temperature of the cells.

The ideal method for an open-circuit deterioration test would be the determination of the decrease of service capacity due to storage over definite periods. This practice, however, would entail much labor and expense where the amount of testing to be done is large.

ADAPTABILITY OF TESTS TO CONSUMERS' NEEDS.

The question may arise in the mind of the consumer as to what extent the cells he purchases shall be tested. It obviously would not be practical for the small consumer to conduct tests on the same scale as those carried on by a consumer using many barrels of cells per year.

It is impossible to formulate any set rules for sampling and testing for any consumer or group of consumers, as the amount of testing done must be regulated by the relation of the cost of testing to the value of the cells purchased. However, we present here suggestions as to the adaptability of these methods to several roughly classified groups of consumers.

The Small User.—In this class may be included the great percentage of consumers. We advise that every cell purchased be read for short-circuit current. Although this reading gives no direct indication of the service capacity of the cell, yet, if the reading is normal for that brand, it may be reasonably certain that the cell is in good condition. It would be impractical for the small user to provide himself with an expensive ammeter, as, for his purpose, a good make of pocket instrument will give readings sufficiently accurate.

The Small Dealer.—This class comprises those dealers who may dispose of from a few hundred to a thousand or more cells per year. The dealer is particularly interested in keeping the quality of his stock up to the standard. As cells are received, a representative sample, say 10 per cent. chosen at random throughout the lot, should be read with a reliable ammeter. If the readings are normal it would scarcely profit to make any further tests. For his protection all cells should be read with the ammeter before being delivered to customers.

The Jobber.—The jobber buys and sells dry cells largely by barrel lots, and in many cases conducts no tests whatever. If he is desirous of keeping his quality strictly up to standard, it would be well to open several barrels in each shipment and test with an ammeter, a dozen cells chosen at random throughout the barrel. If the large jobber wishes to carry the best grade of cell for any service, it would probably pay him to conduct the recommended telephone and ignition tests on a small scale.

Telephone Companies.—The small telephone company consuming less than ten barrels of cells per year could install a standard telephone test of small capacity by fitting suitable electrical contacts on a clock and connecting these with a telegraph relay in such a way as to cause the latter to open and close the dry-cell circuits. We would advise that such a test be maintained by each company and that periodical tests (at least four per year) be made on the shipments of cells received and also on small lots of other brands purchased from time to time for the purpose of test. The small company should also test a representative sample (say 10 per cent.) of all consignments received, with a good ammeter.

The large telephone company using many barrels of cells per year can well afford to install an apparatus for carrying on the test suggested in this report. We would advise that a battery of three cells from each consignment received be placed upon the telephone test. In addition, the short-circuit and open-circuit voltage should be read upon a representative sample of all cells received.

Telephone Train Dispatching a Great Success at Durbar.

The Curzon Durbar of eight years ago, while a pronounced success from a spectacular standpoint, was a chaos in the management, and especially that of transportation. The recent Durbar, profiting by the mistakes of its predecessor, was made an absolute military marvel of management.

In view of this fact it will be of especial interest to American railway men to learn that the success of handling the enormous traffic incident to the Delhi Durbar is largely credited to the American system of train dispatching. It was the handling of the great streams of passenger traffic on the days immediately preceding and following the Durbar that the real test of transportation facilities came. These were the times when there was hopeless chaos at the Curzon Durbar.

The King, the Viceroy, and the governors and lieutenant-governors came in specials; likewise several score of the native princes, while a large part of the tourist influx was handled in extra trains routed direct to the Durbar camp.

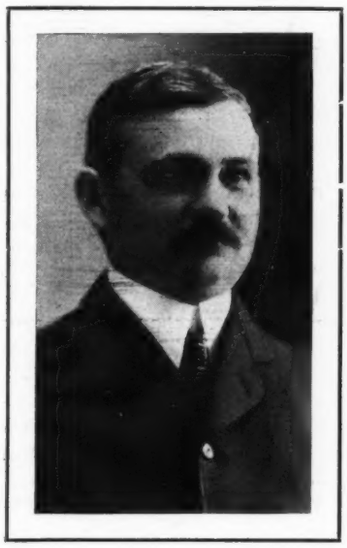
Long before the Durbar the railway people were confronted by the appalling problem of having to send over a hundred trains a day into Kingsway (the main Durbar camp station), where the maximum number that could be handled using the regular Indian "line clear" (manual block) system was about eighty.

It was at this juncture that Major H. F. E. Freeland came forward with a proposal to establish a telephone dispatching system founded on the system used in America. By its use 170 trains were handled in nineteen working hours.

The success of the new method was so surprising that it is to be adopted by several important Indian railways. A rule which helped to prevent confusion was that no special train should be broken up unless absolutely necessary. Many miles of siding were built for these trains and there they were stabled till time for their departure, thus avoiding the endless delays due to switching.

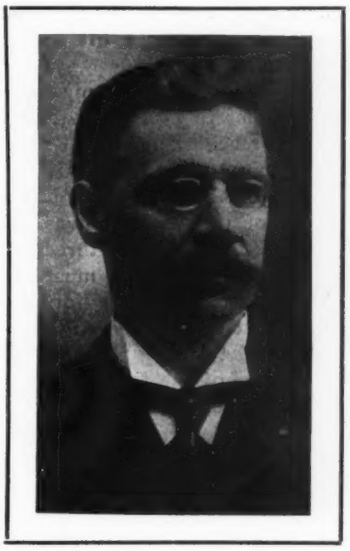
A Quartet of Men Prominent in the Telephone Field

HERBERT W. READE, vice-president and treasurer of the National Pole Co., Escanaba, Mich., has been associated with the cedar pole industry for twenty-four years. He was born in Romeo, Mich., August 20, 1867. After completing his education in the public and high schools of Romeo, he located at Newberry, Mich., keeping books in a general store there. One year later, 1888, he went with the Pittsburgh & Lake Superior Iron Co., at Whitney, Mich., as manager of the store and charcoal plant. He is still secretary and treasurer of this corporation. The company engaged in the business of manufacturing cedar poles and ties from its own lands soon after Mr. Reade entered its employ. This branch of the business grew to considerable proportions and, in 1905, the National Pole Co. took over the cedar department of the Pittsburgh & Lake Superior Iron Co. The stockholders of the two corporations are identical and their operations are conducted in harmony with each other. Mr. Reade is a member of the Escanaba Commandery, Knights Templar, and of the Ahmed Temple, Mystic Shrine, at Marquette, Mich.



WILLIAM FREDERICK GRADOLPH, president of the International Gradolph Electric Co., and secretary of the Economic Ore Treatment Co., both of St. Louis, was born in Toledo, Ohio, August 21, 1871. He was educated in the Toledo and Chicago schools and the International Correspondence School. He is a member of the A. I. E. E., the Am. Electro-Chemical Society, National Geographic Society, Elks, Masons, Red Men and Moose clubs, as well as several sporting and athletic clubs. Mr. Gradolph's first activities lay in the optical line in Toledo and Chicago. In 1886 he entered the Western Electric Co. factory in the switchboard department, going from there to Chicago Telephone Co. in 1888; to Central Union in 1889; to Hudson River company in 1895; to Stromberg-Carlson in 1900; to American Electric Telephone in 1901, as superintendent of plant; to Central Tel. & Electric in 1903, as chief engineer. In 1905 he resigned to enter business for himself, devoting particular attention to the development of a long distance transmission system, under his own and other patents, along which line the present company is engaged.

FRANCIS DAGGER, secretary of the Canadian Independent Telephone Assn., and telephone expert for the Ontario Railway and Municipal Board, at Toronto, Ont., was born in Liverpool, Eng., June 3, 1865. In 1881 he was employed by the Lancashire & Cheshire Telephone Co., at Wigan, Eng., as electrician. In 1885 he associated himself with the Western Counties & South Wales Telephone Co., Bristol, in 1889 becoming manager for Southwest Devon and Cornwall. In 1892 the National took that company over and Mr. Dagger became interested in an unsuccessful movement to organize competitive companies, which was unable to secure licenses. He re-entered the National service in 1894, resigning in 1899 to come to Canada. There, after one year with the Bell company, he aided the Toronto authorities in an investigation looking to a municipal system. In 1903 he was engaged to make a special report to the postmaster general of Canada. In 1907 he prepared plans for Saskatchewan's provincial system. He has been active in rate cases as expert and has been prominent in local and national telephone affairs.



EMMET M. CHAMBERLAIN, manager of the Home Telephone Co., Greenville, Texas, began his career on the farm. He followed this successively by teaching school, teaching expression, running a business college; then the grocery business, real estate, lumber; then was a commercial salesman, from which he graduated into the telephone business. He became manager of the Home Telephone Co. in June, 1903, and has held that position continuously since. Mr. Chamberlain attended the first meeting of the Texas Independent Telephone Association held, when he was elected second vice-president. The succeeding year he was made first vice-president, and the next year, 1910, he was elected to the presidency. While vice-president of the state association he was also president of the North Texas district organization, presiding, for four successive years, over the meetings of that group, two of which were held while he was president of the state association. Mr. Chamberlain was born in Pike county, Ill., on December 20, 1852. He was educated at Lombard University, at Galesburg, Ill. He is a member of the Greenville Booster Club.

New York Independent Outstrips Bell.

One of the first Independent telephone exchanges built in New York state was that of the Hornellsville Telephone Co. Hornell was a thriving village of some 11,000 people in 1900. It now has a population of nearly 14,000. The name of the village, until about three years ago, was "Hornellsville."

This company was incorporated in September, 1909, with a capital stock of $50,000. Back of the company were a number of public spirited, representative business men of Hornell.

At the time the company was organized the Bell had been operating in that village for practically twenty-three years, reaching about 325 subscribers. The new Independent company, taking this figure as a basis, decided to build to take care of an ultimate of 350 subscribers. The basis of this decision was that if the Bell company had operated for twenty-three years and had only secured 325 subscribers, that must include all the people of that locality who had use for a telephone. They thought if they could get an even 300, they would be doing pretty well. The business began to come in and, before the installation of the first switchboard, 525 subscriptions to the service had been secured. Consequently, the order to increase the switchboard to an ultimate capacity of 700 instead of 350, was placed before the first installation was complete. At the opening of the exchange in February, 1901, there were 600 contracts for service. Today, over 1,700 stations are served.

For the next seven years the exchange grew regularly and rapidly. Additions to the outside plant and switchboard were made from time to time to take care of this increasing business.

In 1908 it was found that the ultimate capacity of the switchboard originally installed, and the subsequent additions thereto, was totally exhausted; that the business had outgrown the greatest expectations of its organizers and that to take care of the increasing business, more board capacity and more exchange and office room were required.

It was decided to build an up-to-date fire-proof steel and cement building as a permanent home of the Hornellsville company. This building was erected in 1909, at 18 Broad street, and is counted as one of the best and most substantial business buildings in Hornell.

The operators' room is large, commodious and well lighted, and contains the latest type of full multiple, common battery, lamp signal switchboard, having eight local and two toll positions. The ultimate capacity of the board is 2,400 lines. There are 1,200 lines coming into the exchange at present.

The wire chief's room is equipped with all the modern conveniences for rapid and efficient testing of lines. Rest and locker rooms are provided for the operators. There is a customers' room in which are located the soundproof booths, writing tables and other conveniences for the use and comfort of the patrons. The manager's office, the bookkeeping and accounting offices occupy the front of the building overlooking Broad street.

The outside plant at Hornell is all underground in the business section. The cable and open wire plant is well and substantially constructed.

The long distance lines of the Federal Telephone & Telegraph Co., of Buffalo, radiate in every direction from Hornell, thus affording the most excellent toll service to its patrons. Hornell is, therefore, an important toll switching station.

The rural development around Hornell is practically complete, there being no section around the city which the Federal or rural company's lines connected to Hornell, do not reach.

H. M. Bennett, of Hornell, was the first manager of that exchange. It was he who, through active work, laid the foundations for future growth. He was succeeded in 1905 by C. M. Kelley, the present manager. Mr. Kelley, through careful attention to every detail of the business, has been instrumental in bringing the company to its present success.

At no time since the inception of the Hornell exchange has there been any halt in its progress. It now stands as one of the firmly established and well known business concerns in Hornell and has a large number of warm and ardent supporters among the prominent business men of that city.

The Bell company's list, numbering approximately 600, (against over 1,700 Independent), has barely doubled since the time the Independent exchange was opened in 1902, while the Independent's gain, during the same period, is nearly six times that of the Bell.

Contemporaneous with the Hornell exchange was built the plant of the Canisteo Telephone Co. The management of this exchange is the same as that of Hornell. It is a magneto plant with over 400 subscribers connected to its switchboard. The entire rural community surrounding Canisteo is covered with Independent telephone lines, all of which connect with the Canisteo board.

The Bell company has approximately twenty-five telephones in Canisteo, which are served directly from the Hornell exchange.

United, of Abilene, Extending System.

The United Telephone Co., of Abilene, Kans., is just finishing the rebuilding of its plant at Chapman, under the supervision of G. R. Ewalt. Mr. Ewalt recently completed the placing of considerable underground cable at Woodbine and is preparing to install approximately 12,000 feet of aerial and underground cable at Minneapolis, another of the United exchanges. Later the company will add to its underground system at Abilene.

Diamond State Bell Finally Taken Over.

Preliminary to the final taking over of the Diamond State Telephone Co. by the Chesapeake & Potomac Telephone Co., both Bell subsidiaries, a petition was filed with the Maryland Public Service Commission by the latter company requesting that it be allowed to absorb the smaller corporation. The Diamond State operates mainly on the eastern shore of Maryland and Virginia.

Texas Company Completing Toll Lines.

The Union Telephone Co., recently organized at McKinney, Texas., announces that long distance connections have been made with Plano on the Dallas-McKinney line and that rapid progress is being made on the line from Plano to Dallas. Construction is also being rushed on the McKinney-Sherman and McKinney-Pilot Point long distance lines and connections will soon be made with these points.

Would Compel Better Service From Bell.

The city council of Richmond, Cal., is making an investigation of the Pacific Bell lines in that city, with a view to compelling better service and lower rates.

New Lines in Mexico.

A new telephone line is being put up between the towns of Montemorelos and Rayones, in the state of Nuevo Leon, and another is to soon connect Rayones with Galeana.

Practical Subjects—Letters and Discussions

A New Type of Dry Cell.

Some time ago I found an unusual case of trouble, which may prove as interesting to others as it was to me.

It occurred on a common battery, lamp signal, hotel board, and the lamp of the line in question was reported permanent. On test, the line showed a partial short and ground. The line consisted of cable to the floor distributing box; rubber covered duplex to the room outlet box; and commercial lamp cord to the telephone, a part of which was concealed in picture molding. After opening at a couple of points, the trouble showed in the lamp cord, which was found to be wet for a space of 15 or 20 inches.

The peculiar part was that, with only the lamp cord connected to the instrument, there was battery across the line and enough to make the transmitter "come up" about like two weak dry cells would. The wet wire was cut out and when connected to a Weston voltmeter showed a reading of .3 volts. As the wire had dried out considerably by the time it was measured, I think it would have measured at least one volt or possibly more as it lay in the molding.

What were the elements which went to make up this most unusual cell? Get out your old chemistry and figure it out.

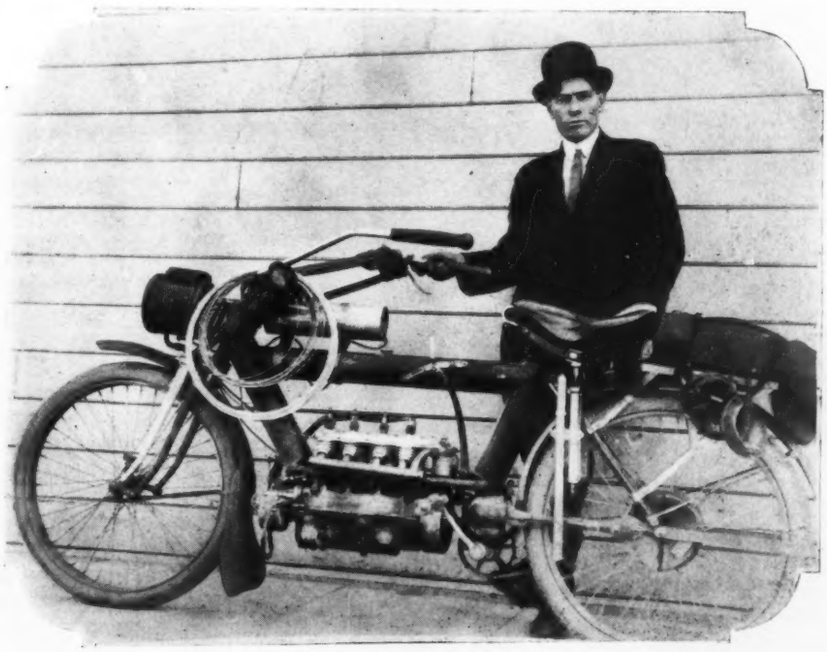
Omaha, Neb. T. S. Risser.

The Motorcycle Troubleman.

If all telephone patrons were asked to specify what they most desired of the telephone companies, a big majority would undoubtedly answer, "good service," but few of them would know what an important part the motorcycle is playing in maintaining telephone service. Nearly every telephone company now has a motorcycle man who is called upon at all hours to clear trouble on the lines throughout the company's territory.

In Oakland, Cal., R. W. Sicafoose, troubleman for the Pacific Telephone & Telegraph Co., knows something about what it means to keep up the standard of telephone service. For nearly a year he has been responding regularly when trouble was reported. In Alameda County, California, he has covered more than 8,500 miles of roads. With wire, climbers, tools and a telephone test set hung on his motorcycle, he is ready to go to any place near Oakland at a moment's notice.

With the addition of the motorcycle, telephone efficiency has been greatly increased. Storms or accidents which break the wires along the country roads, no longer inconvenience patrons for unlimited hours. When such accidents occur the motorcycle troubleman is dispatched and the difficulty readily adjusted. The motorcycle is ready at all times, day or night. It travels swifter and surer than any other vehicles used by telephone companies for "trouble shooting," and is responsible to a great degree for quick resumption of service on lines in trouble at a distance from the exchange.



The Troubleman's Motorcycle Ready for An Emergency Call.

Telephone Lines on High Tension Power Poles.

The methods used by the San Joaquin Light & Power Corporation of California in construction of its telephone lines on the same poles with its high-power circuits is described in a recent issue of the Journal of Electricity, Power and Gas.

The telephone wires are carried on all lines on a two-pin arm under the power wires which carry current at pressures from 60,000 volts down to 2,400 volts. They are placed eight to twelve feet below the high tension wires. The telephone wires are of No. 8 hard drawn copper and on the transmission line poles are provided with taps running down the pole so that a patrolman may cut into the line at certain points. The telephone equipment is of a high-class, built to order and consists of standard bridging sets of various resistances from 1,600 to 2,500 ohms, depending upon the location of the instrument.

Insulated stands are provided at every telephone instrument. The telephones are mounted upon iron pipe frames and are in many cases equipped with a marble panel switchboard for operating upon the various lines.

In operating a telephone system in conjunction with high tension transmission, there is always more or less interference from the inductive effect of the high tension current. This is especially true if there is any unbalancing of the high tension circuits or accidental ground on the telephone circuit. This problem of inductive disturbance to telephone lines has been a bug-bear to all transmission companies, but this company has overcome the difficulty to a great extent in a novel manner.

At terminal points a standard 3 kw. 2,000 volt lighting transformer is introduced between the telephone wires before leaving the last pole. The primary winding of the transformer is bridged across the telephone circuit. The center point of the winding is carried to ground. The secondary winding is left open. This grounding coil serves to remove all static potential from the telephone circuit without in any way interfering with the clearness of speech.

Between these transformers and the telephone instrument are inserted fuses placed in porcelain tubes as an added precaution. This plan has worked admirably under all conditions for a number of years and seems to have satisfactorily solved the telephone difficulties for this system.

Trouble Caused by Reversed Connection at Relay Rack.

Soon after I came to the exchange, the chief operator reported that on a couple of lines, the line lamp would at times remain burning while the subscribers were talking. Also sometimes after a conversation was started, the light would come in. When this occurred, the subscriber complained that he could hardly hear.

Going to the board, we found that by inserting the plug

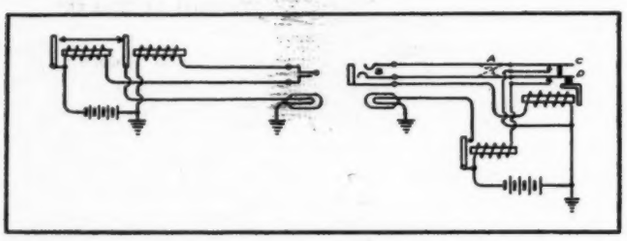


Diagram of Reversed Connection Which Caused False Signal.

slowly into the jack, the light would go out and stay out, also the transmission was good. If we inserted the plug quickly, the conditions were as reported.

On inspecting the wiring we discovered that on the rack where we should get battery, we got a ground. Going to the relay we saw where the tip and ring wire had been reversed at *A* when installed. When the plug was inserted slowly, the battery from the sleeve of the plug would magnetize the cut-off relay clearing the line before the sleeve would reach the spring *B*.

On inserting the plug quickly, the stiffness of the relay springs would retard the action of the armature sufficiently to permit the sleeve to touch the spring *B* before the contact at *C* was broken, and this would place a shunt around the cut-off relay to ground. The contact at *D* would not be broken and the line relay would remain pulled up.

A few small plugs caused the second complaint. When in the jack, the plug would be jarred, causing the sleeve of plug to clear the sleeve of the jack and allowing the cut-off relay to fall back thus throwing a shunt around the relay.

We use a two conductor cord on a three wire board.

Notingham, Ohio. J. W. Hepner.

Insulated Wire Would have Prevented This.

We had a line that showed short and the trouble man found it clear to the subscriber's residence.

There the drop run down the weather boarding in the rear of the house, and terminated on knobs, both sides of the line being of bare wire. The subscriber had driven a nail between the wires and hung up a galvanized iron wash tub, putting a short on the line. I never heard of subscribers doing this before.

L. G. Poe,

Logansport, Ind. Logansport Home Tel Co.

Cleaning Jack Contacts.

A frequent case of trouble in our exchange is the inability of the subscriber to ring central on account of dirty contacts in the jacks. I have found a simple and easy remedy for this. It is to pump up a good pressure in the blow torch and shoot a fine stream of gasoline into the jack, then work the plug back and forth a few times and the trouble is cured, without the inconvenience of removing the jack.

Clayton, Ill. F. L. Clark.

A Series of Line Crosses.

One afternoon after the wind had been blowing steadily for about a week, I had an interesting case of trouble. At noon I received the report that one of our farm lines was crossed with our Easton trunk line.

The lines are on the same lead for about four miles west, one line taking pins 3-4 and the other line pins 7-8. Here they split, the farm line going north and the trunk line continuing west to Easton. According to all reasoning, the trouble could be no farther than the corner where the lines split, although a cross between pins 3-4 and 7-8 is a little unusual.

When the trouble man reached this corner, he called in saying he had found nothing. As the lines were still crossed, I told him to follow them back, examining all shunt boxes carefully. As this inspection revealed nothing, I thought I would listen in on the lines awhile, and then I found the trouble by chasing down a conversation I heard.

I found that our farm line was crossed with the Easton Bell line, two or three miles north of where the lines separated, and the same Easton Bell line was crossed with our Easton trunk line in Easton. Thus I was getting the cross between our two lines through the Easton Bell line.

Lazarus Loeb, Wire Chief.

Leavenworth, Kans. Peoples Home Telephone Co.

Telephone Detects Defective Plumbing.

Recently a subscriber's line in the Schuyler exchange was reported by the traffic department for a "steady signal" at the switchboard, says W. F. Heep in The Telephone Review. An inspection determined that the line was O. K. to where it entered the subscriber's premises.

The house was closed for the season, however, and it became necessary to locate the resident. After much difficulty he was interviewed and arrangements made for the telephone man to enter the house. Upon doing so, it was found that there was a leak in the flush tank in the bathroom and the water had soaked through the floor below and stood three inches deep in the cellar.

As the telephone instrument was located directly below the bathroom, the water had wet the instrument and stand cord, short circuiting the line and causing a steady light in the central office.

While considerable damage was caused by water, it would probably have been more serious if the telephone had not been affected or had been denied for the season. This also points out the moral that residents should see that the water is shut off before closing their houses for the summer.

Operator Saves Many from Drowning.

Five hundred persons residing in the valley of Milbrook, Essex county, N. Y., were recently saved from death owing to timely warning given by a telephone operator in the Port Henry exchange. She sent word along the valley that a new concrete dam sixty feet high, impounding a lake two miles long, a half mile wide, and fifty feet deep, had given way and that the waters were rushing down the valley. From the hillsides the residents saw the torrent carry away their dwellings, inundate two villages, sweep out two other dams, and destroy three power plants.

Graduate Scholarships at the Massachusetts "Tech."

The committee on graduate scholarships has recommended scholarships for R. D. Huxley, A. L. Matte, L. C. Tomlinson, E. S. Bray and H. E. Dexter, who are candidates for advanced degrees in electrical engineering at the Massachusetts Institute of Technology. Three of these young men are candidates for the degree of doctor of engineering. The popularity of the post-graduate study of electrical engineering at the Institute continues to increase. A number of Master's degrees in electrical engineering will be granted this year in addition to fifty or more bachelor's degrees.

Cases and Discussions Concerning Public Relations

This Department Has Been Established as a Regular Weekly Review of Proceedings Before Courts, Commissions or Civic Bodies—Communications Relating to This Branch of Work are Invited from All Persons Interested in Past Cases, or Those to be Heard in the Future

Refuse to Permit Vote on Telephone in Denver.

The right of the people of Denver to vote upon the question of whether they desire to sell the use of the streets of the city to the Mountain States Telephone & Telegraph Co. for $25,000 a year has been denied by District Judge Harry C. Riddle, who refused to grant the writ of mandamus asked by James R. Walker, D. C. Burns and J. H. Gabriel to compel the city council to pass an ordinance submitting the question to the people at the coming election.

Judge Riddle sustained City Attorney Lindsley's demurrer to the complaint and dismissed the petition, upholding Lindsley's plea that the city council would not have time to pass such an ordinance; that even could such an ordinance be passed, it could not take effect for thirty days, under the provision of the city charter, and by that time the city election will be over.

Last July the council passed an ordinance accepting a proposition made by the Mountain States company, offering to pay the city $25,000. It was stipulated that the money should be used in the improvement and maintenance of parks, streets and boulevards. The voters of the city circulated petitions for a referendum.

These petitions were signed by 15,829 voters, were filed with the elections commission, found to be sufficient and were referred to the city council. When the council issued the official call for a municipal election a short time ago it failed to include the telephone question. It was then that a petition for a writ of mandamus was filed in court.

Lindsley said the council had investigated the petitions, found that a great number of the names signed to them were fraudulent or fictitious, that it was impossible to segregate the bona fide names from the spurious and for that reason the council had thrown the petitions out.

Oppose Numbering Poles in Oklahoma.

The Oklahoma Telephone Association has sent out letters to its members calling upon them to carefully consider the proposed order of the Corporation Commission requiring the stenciling, or otherwise numbering, of poles of telephone and telegraph companies throughout the state.

The letter, which is signed by R. S. Goffe, president of the association, declares that the order, if issued, will cause much expense and trouble and will further necessitate keeping a record of the location of each pole, its removal and new location, etc., without any corresponding benefit to the public.

The hearing on the order, which was set for May 14, has been postponed for thirty days.

California Cities May Fix Rates.

Inquiry by the city attorney of San Diego of the Railroad Commission resulted in the declaration by him that the commission's advice was to the effect that cities in California had power to fix rates. This is conferred, it is stated, by a constitutional amendment adopted October 10, 1911.

Bell Would Buy Pasadena Home.

The Pacific Telephone & Telegraph Co. has petitioned the state Railroad Commission for permission to purchase stock of the Home Telephone Co., Pasadena, Cal., proposing to consolidate the two plants.

The petition states that the Bell holds an option on 4,879 shares of stock in the Independent company at $44 per share. There are 5,190 shares of stock outstanding. The value of the Home company's property is estimated at $730,000.

Allege Discrimination in California Town.

The Chamber of Commerce of San Leandro, Cal., has lodged a complaint with the state Railroad Commission alleging discrimination in rates on the part of the Pacific Telephone & Telegraph Co. The specific allegation made is that the company is making a charge of ten and fifteen cents for service from old San Leandro to Broadmoor, a community annexed to the former town several years ago.

It is claimed that the people of San Leandro can communicate with the cities of Oakland, Berkeley or Alameda, from five to fifteen miles away, for a flat five cent rate, which is less than the rate to parts of their own city.

Not Required to Pay Occupation Tax.

The city of Los Angeles, Cal., has lost in its attempt to compel the Home Telephone & Telegraph Co. pay an occupation tax of $50 a month, in addition to the percentage of its gross receipts required by its franchise. The company paid the tax under protest for a year and then brought suit to secure its return. The court held that the city, when it granted the franchise, imposed in fact an occupation tax and that it could not enforce an additional one. The case may be appealed.

Seattle Considers Municipal System.

A resolution has been introduced in the Seattle, Wash., city council looking to the establishment of a municipal telephone system. It was referred to the city utilities committee. The resolution called upon the superintendent of public utilities to furnish the council with as much information as may be at his command concerning the relative merit of telephone systems now in general use, together with estimates of the cost to cover a system of 20,000 telephones and station equipment sufficient for 30,000 telephones.

Under the state law of Washington, it is stated, no municipality is empowered to establish or maintain and operate a telephone system.

Wisconsin Commission Allows Increase.

On application of the Plymouth Telephone Co., of Plymouth, Wis., the state Railway Commission has permitted that concern to increase its rates. Business service has been advanced from $1.75 to $2 per month, and residence from $1 to $1.50. The commission made a valuation of the plant and will compel the company to install a complete and uniform system of bookkeeping.

Michigan Toll Rates Made to Conform to Law.

A dispatch from Grand Rapids, Mich., states that both companies there are adjusting their toll rates to conform to the provisions of the Giles law demanding uniformity. The Citizens company's new schedule is based on a charge of ten cents for the first twelve miles and five cents for each additional eight miles.

Agreement Reached at Leavenworth.

It is stated that the city officials of Leavenworth, Kans., and the officers of the Peoples Home Telephone Co. have reached an agreement in the matter of a franchise to be voted the

latter company when it takes over the property of the Bell company in that city. The matter is in abeyance, it is said waiting only the approval of the principal interests in both companies.

Extensions and Improvements at Waco, Texas.

Buford Adams, general manager of the Brazos Valley Telegraph & Telephone Co., Waco, Texas, in a letter to TELEPHONY confirms the purchase of the interest of Edward Rotan, the company's president, by B. C. Hyde, of Kansas City, and his associates.

It is the intention of the new interests to expend several thousand dollars in the betterment of the Waco plant, definite plans for which are now in course of preparation. The company will also build a long distance line from Waco to Dallas, comprising five physical and two phantom circuits. This will cost approximately $60,000 and will probably be completed within ninety days.

New Idea in Convention Badges.

A novel and practical scheme in the matter of badges was tried out by W. J. Uhl, secretary of the Indiana association, at the recent convention. The usual badge effect prevailed, with the bar pin at the top, the ribbon, bearing the association's name, etc., and the pendant at the bottom. But, in this instance, the latter could be detached, after the meetings were over, and, with the aid of a small strap and buckle, also furnished, could be converted into a serviceable watch fob.

By this means there is no doubt that many of the badges, which would ordinarily have been thrown into the discard after the convention, were preserved and worn as fobs. Thus they are still carrying the Independent shield.

Queries on Theory and Practice

Cross Ringing of Bells Through Grounded Cable System.

We are having some cable trouble. We use a grounded system altogether. It is a 50 pair cable, used metallic from the switchboard to the terminals, grounding one pair of the carbons at the can by using a large copper wire six feet in the ground and connected to the frame of the terminal. My trouble seems to be that when we ring the people through this cable, the bells on several of the telephones seems just to tingle but do not show crossed by operating the drops. The subscribers call in and complain that their bells rang and that they answer and do not hear anyone. There is no one in this cable who cannot ring central. I have thought probably the ground on this cable must be broken somewhere in the insulation and am putting on a new ground throughout.

There are two possible sources of the cross ringing of the bells, a leaky cable and lines, or a high resistance in the ground connection. You can test the cable for leaks by cutting off the lines and ringing from pair to pair or better by a voltmeter test with sufficiently high battery power. But if your ground is poor, the return current will divide, some coming back through each bell whose telephone is connected to this lead.

When the number of telephones connected to one lead is small, as in this case, the ground connection needs to be of very low resistance. Unless the ground is very wet, the six foot wire does not have enough area. You should have a broad copper plate, two or three square feet in area, planted in permanent moisture.

The reason the bells ring but the drops do not show crossed may be due to two causes. The subscribers do not ring in with the same power that the usual pole changer or power generator rings out. The latter has higher voltage. Also the drop is not usually as sensitive as a bell, and so will not respond as readily to small current.

Voltmeter for Wire Chief's Desk.

In buying a voltmeter for wire chief's use, which kind would you advise, center scale or the ordinary kind?

As a usual thing the ordinary scale, with the zero at one end, is much to be preferred to the center scale instrument. The placing of the zero at the center is done so as to obviate the necessity of throwing a reversing key when encountering a foreign voltage. The disadvantage is that if the zero is placed in the center, the length of the scale from zero to the highest reading is cut in two. This means that readings are much less accurate and more difficult to make than on the standard scale.

For the usual run of work, the tester needs only the connections in series with the battery. These are for testing grounds, shorts, and crosses. As long as the voltmeter is used thus, it should not be reversed, for its negative terminal should be attached to the negative terminal of the battery. But when testing for the presence and direction of foreign current on the line, the center zero scale instrument or a reversing key is necessary. The latter is to be preferred, both for accuracy and for the fact that the use of the reversing key will tend to fix on the mind the oppositeness of the current under test.

Condenser in Talking Circuit of a Bridging Telephone.

I would like to know why a condenser when placed in the receiver circuit of a bridging telephone, will enable one to ring other parties on the line even though the receivers of a number of telephones connected to the same line have been removed from the hookswitch.

The signaling arrangement of a bridging telephone consists of a bell wound say for example to a resistance of 1,000 ohms, and a generator normally disconnected from the line. The generator is so arranged that when driven, an alternating current is sent over the line and through the windings of the ringers in other sets on the line. Owing to the necessity of providing a comparatively small signal current generator, it is necessary to design this machine for delivering the maximum amount of current at the requisite voltage. This voltage may under normal conditions while operating one ringer, be somewhere between 70 and 80 volts.

If a generator under such conditions produces a pressure of say 70 volts, additional telephones may be added to the line until the voltage drops to so low a value that the current, which is sent through the ringers is not great enough to produce a satisfactory and effective ring.

The amount of current which passes through a 1,000 ohm ringer winding is much less than the current which would pass through the combination of a telephone receiver and the induction coil winding which is connected across the line when the receiver is removed from the hookswitch, due to the lower resistance of the latter. From five to ten times the amount of current will pass through stations where a telephone receiver is removed from the hookswitch than would pass through a station where the ringer alone is connected.

It has been found that a condenser offers a much lower resistance to the passage of high frequency voice currents than it offers to the frequency ringing currents. Hence the placing of a condenser in series with the receiver practically amounts to opening the receiver circuit as far as the low frequency ringing current is concerned. The high frequency voice currents readily pass through the condenser while the ringing current passes through the ringer coils only and is strong enough to produce a signal.

Sparks from the Troubleman's Department

Jones had just run over to see if Mr. and Mrs. Blank would go to the theater with them. Mrs. Blank was sorry, but, unfortunately, Blank was out. Probably he was at the club. She would telephone. The following conversation ensued: "Halloa! Is this the ——— Club? Is my husband there? Halloa! Not there? Sure? Well, all right, then; but hold on. How do you know? I haven't even told my name." "There ain't nobody's husband here—never," was the wise attendant's reply.

The latest out-of-the-ordinary use of long-distance telephone service is reported from Harrisburg, Pa.

"Gus" Edwards, comedian and song writer, was playing in the Orpheum Theatre at that city some weeks ago. During his stay he received a message from the owner of the musical comedy "Over the River," in which Eddie Foy now is starring in New York City. The theatrical magnate stated that he needed a new song for his production —that he must have it at once.

Such a demand would put an ordinary song writer completely out of business.

Not so Edwards. He had a reputation for versatility to uphold. He accepted the contract unconditionally. The same night, after finishing his day's work at the theatre, he went to his hotel, sat down at a table and wrote the entire music for the song.

The next morning Edwards decided that Will Cobb, the lyric writer of New York, was the one man to supply words for his creation. He called him by telephone. "Will," said Edwards, "Ziegfeld wants a new song for his show, 'Over the River.' He called me yesterday and asked me to take the job. I think I've got the air all right, but I need help on the words. Will you take the job?"

"Sure," answered Cobb. "Can you give me a couple of weeks?"

"Couple of weeks nothing!" shouted Edwards. "This thing must be done right off the bat. It's a case of rush. Can't you jump on the next train and come over here to Harrisburg?"

"Not on your life," said Cobb, "my desk is stacked up with work now—most of it is that rush stuff."

Silence followed this declaration. Edwards was the man to solve the puzzle. "Say, Cobb," he said, "hold your ear close there; I'm going to sing the air to you. See if you can get it. — — Did you get me at all?"

"Indeed yes!" exclaimed Cobb. "Tell you what, old man, if you'll sing that thing over a few times more, the same way, I think I can fix you up."

Slowly Edwards sang the air of his new song into the telephone transmitter at Harrisburg. He repeated it three or four times. At last Cobb cried, "That will do, Gus, I've got it."

Mr. Cobb immediately set to work on his latest rush order, and with unqualified success. The song was put on at the Globe Theatre, New York, the following Saturday. It is called "A Beautiful Night, with a Beautiful Girl." It was sung, and still is being sung, by Melville Stewart and Lillian Lorraine in Eddie Foy's show.—Telephone News.

THE ELECTRIC AGE—WILL IT CAUSE A STRIKE?

"What with the guvnor's telephone and the missus's hot plate and Miss Mabel's new electric toaster, breakfast is now one long blooming hurdle race."—Jeames's letter to a friend.—From Punch.

A man called one of the Fort Worth long distance operators a short time ago stating that he wished to put in a call for a person at Denton. The operator commenced recording the call in the usual manner, but when she asked the name, was surprised when he informed her that he did not know it.

"Where shall I find him?" she asked.

"I don't know," said the man. "All I know is that he owned a big white bull dog and that I have often seen him around various places of business." The operator accepted the call with the understanding that she would do the best she could in locating the party, and immediately got into communication with the Denton office. The dog had advertised his master well, however, and in a very few minutes she had succeeded in finding the party wanted, accompanied by the bull dog, and the call was completed. — Southwestern Telephone News.

A young lady named Fife recently called at the Albany office and signed for telephone service, at the same time requesting an extra listing for B. Drum, who resided at the same address. A few days later a feminine voice inquired over the telephone, "Is this the commercial department?" The reply was in the affirmative. "Well, discontinue the extra listing of B. Drum, as he beat it last evening."

Our division advertising manager at Albany vouches for the foregoing as a true note.—Telephone Review.

The claim department reports that one of their patients has blepharo-conjunctivitis, apparently being caused by a diplo-bacillus (morax-axenfeld) infection, and there later developed in the case marked photophobia, blepharospasm, with oedema and hypopyon of right eye, and eczema with acute rhinitis, with some symptoms of a struma diathesis; the patient had 4,600,000 red cells but the white cells were not counted. The claim agent reports, however, that the doctor who handled the case is able to get around and take care of his practice and the patient has survived these terrible complaints and is likely to be well soon.

We publish this as a caution to all employes of the company and advise them to consult medical authority at once if they have such a combination as that mentioned above or any one of the symptoms. If they neglect it the claim department says they will not be responsible.—Mountain States Monitor.

Pennsylvania Company Reorganized.

The reorganization of the Tri-State Telephone Co., under the same name, was effected at a recent meeting of stockholders in Uniontown, Pa. E. C. Higbee, H. L. Robinson, F. H. Rosboro, R. W. Dawson and Daniel Sturgeon were elected directors. The directors elected Mr. Sturgeon president, Mr. Higbee secretary, Mr. Dawson treasurer, and A. M. Creighton general manager. Mr. Creighton has been division manager for the American Union Telephone Co. in Uniontown.

The reorganized Tri-State will cover all territory between McKeesport and Point Marion. The company has long distance connections to all points in Pennsylvania outside of Philadelphia and negotiations are on for entrance into that city. The Tri-State Telephone Co. was bought at sheriff's sale last December.

Japan to Install 27,000 Telephones this Year.

Japan is to install 27,000 additional telephones this year, the cost of which, with the accompanying equipment, will be approximately three and a quarter millions. New exchanges are to be established in Kobe and Osaka.

Mississippi Convention Set for This Month.

The Mississippi Independent Telephone Association will hold its annual convention at Meridian, Miss., on June 25. It has not yet been determined how long the meetings will last. The duration, and the program, will be announced very soon.

Pacific Bell Asks Franchise at Tacoma.

The Pacific Telephone & Telegraph Co. has filed a petition with the city council looking to the granting of a new franchise. This is designed to replace the existing Bell grant and that of the Home company, which latter was revoked by the council after the company was sold to the Pacific.

Thirteen Millions for British Expansion.

The postmaster general of England has stated that provision is being made for the expenditure of about £2,600,000 ($13,000,000) in the extension of the trunk and local systems during the current year, and that new telephones are being provided in London alone at the rate of between 500 and 600 a week.

From the Patent Office

By Max W. Zabel

Automatic Telephone and Fire Alarm System.

J. W. Lattig and C. L. Goodrum, Rochester, N. Y., 1,027,053, May 21, 1912; assigned to American Automatic Telephone Co., Rochester.

The ordinary automatic telephone switches are provided for effecting interconnection between the various lines. Special calling devices are furnished at one or more subscribers' stations to operate special signal apparatus associated with the switching devices at the exchange.

Lineman's Climber.

J. Donnelly, Branford, Conn., 1,026,853, May 21, 1912.

The climber comprises a leg portion, foot portion and a leg pad. The leg pad is provided with a loop through which the upper end of the leg portion extends. The leg pad is also provided with vertical loops through which two members of the leg strap extend, these leg straps being secured to the leg member. The leg portion is provided with the customary spike.

Earpiece Disinfector.

L. Block, New York, 1,027,174, May 21, 1912; assigned to L. E. Block, New York.

A grooved collar, in which disinfectant is provided, is formed in an ear cap. An adjustable screw cap partly closes the opening of this groove.

Multiple Cable Jack.

T. J. Cope, Philadelphia, 1,027,104, May 21, 1912.

The jack has two separable jaws which may be inserted between certain cables which are banked upon the rear of a switchboard or other inaccessible places. The jaws are so arranged that they may be readily pushed apart thus separating the cables of the bank so that a cable within which repairs are to be made, may be readily reached.

Line Tapping Connector.

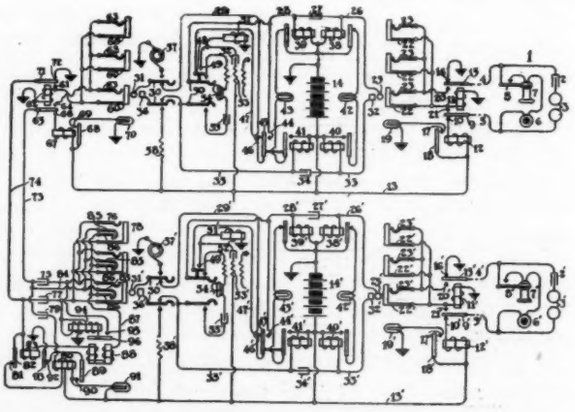
J. F. Richardson, Montreal, Can., 1,027,279, May 21, 1912.

This invention relates to a line tapping device for purposes of making connections with line wires along an overhead circuit. It consists of a pole on the top of which a permanent contact is mounted. A second contact adapted for attachment to the second line wire is also secured to the pole top, being connected to a flexible cord. The flexibly mounted contact is first hung over a line wire and the pole is then moved over so the permanently mounted contact may be hung over the second line wire.

Trunking System.

F. M. Davis, Chicago, 1,026,850, May 21, 1912; assigned to Kellogg Switchboard & Supply Co.

Two common battery exchanges connected by trunk line 73, 74 which terminates in jacks 63 and 76 are shown. Entering telephone lines terminate respectively in the jacks 23, 23'. The object of the invention is to display a signal, 70, and 91, at the opposite ends of the trunking circuit whenever a connecting circuit is connected with the opposite end of the trunk.



The arrangement is also such that the supervisory signals, 43 and 43', are illuminated whenever their respective cords are connected with the trunk jacks, or effaced when the cord circuit is associated with the opposite end of the trunk at the other exchange.

Common Battery Exchange System.

E. E. Clement, Washington, D. C., 1,027,239, May 21, 1912.

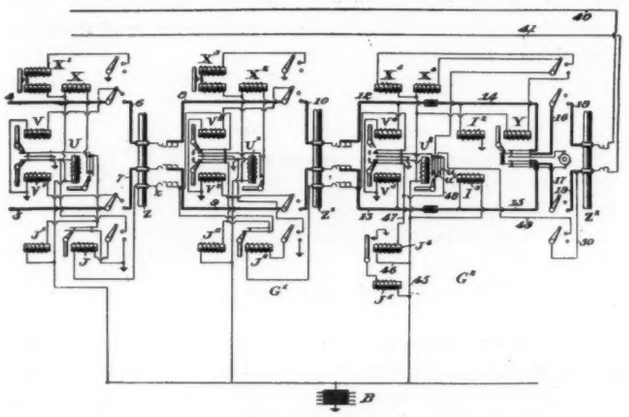
A two or three wire circuit, it is claimed, can be used with this common battery system. Current is supplied from the common battery through supervisory relays and is led back from the other side of the circuit to the bat-

tery through the respective line cut off relays. The signals thus serve for signaling purposes and also to control the distribution of current to the line.

Exchange System.

J. L. Wright, Washington, D. C., 1,027,392, May 21, 1912; assigned to North Electric Co., Cleveland, Ohio.

A reverting call system for automatic exchanges is shown which is intended to make it possible for one party on a party



line, to call another party on the same party line. For this reason a special reverting busy test is employed by balancing the potentials on the test relay when testing back on the calling line only. When the test is thus made by a calling party to obtain connection with a called party on the same line, then the last rotary impulse coming over the line closes the circuit of the relay V^5, which in turn closes the circuit of the relay U^2, thereby connecting the test relay J^4 to the sleeve 19, side of the trunk. At the same time that this relay is connected to the sleeve side of the trunk, battery is placed on the tip side of line. As the tip side of the line in this case is connected to the sleeve side of the trunk, it is impossible for the test relay to operate as it is connected to the battery itself.

Indicating Ringing Key.

W. E. Harkness, East Orange, N. J., 1,026,160, May 14, 1912; assigned to Western Electric Co., Chicago, Ill.

The party line key described, has rotatable actuating buttons instead of plungers, so that the operator can more readily discern which button was the last actuated. Two tiltable plates and connected together by links so that they move in harmony, are provided to hold the actuated button by means of an extension. The actuation of any other button releases the formerly actuated button.

Sanitary Mouthpiece.

C. V. Fuller, Newark, N. J., 1,026,503, May 14, 1912.

A sanitary telephone mouthpiece is herein provided which is made of paper or other material. It is collapsible and cup shaped so that it may normally occupy a small space, but may be extended to fit the interior surface of the ordinary mouthpiece when desired.

Watchcase Receiver.

W. O. Beck, Weehawken, N. J., 1,026,196, May 14, 1912; assigned to Western Electric Co., New York.

A watchcase receiver is disclosed in this patent which has interiorly located binding posts. It has a core mounted in the cover of the instrument to which the coil may be secured by means of a riveted washer.

Electrical Contact.

E. E. Clement, Washington, D. C., 1,027,240, May 21, 1912.

Means for forming rivets which are designed to be made up in strips are set forth in this invention. A German silver wire is covered with a thin coating of platinum. This duplex wire is then rolled to provide constricted portions, so that but little German silver remains and the wire may then be severed at these points. The cut off portion is then upset at one extremity to form a head so that a rivet, the body portion of which consists of German silver suitably coated with platinum is formed. This process eliminates the expense of solid platinum rivets, it is claimed.

Telephone Bracket.

E. P. Guthrie, Oklahoma City, 1,026,260, May 14, 1912.

The device consists of a portable bracket and a vertically disposed, curved support having a vertically movable stand pivoted to one end and a keeper at the other end. The stand is adapted to positively engage the base and the keeper to yieldingly engage the upper portion of the telephone.

Antiseptic Mouthpiece.

F. C. Tabler, St. Louis, 1,026,414, May 14, 1912; assigned 51 per cent. to G. V. R. Mechin, St. Louis.

A mouthpiece is described which consists of a flexible antiseptic carrying member positioned in the rear of the mouthpiece. It is adapted to be moved so as to bring a fresh section into position immediately behind the opening of the mouthpiece for each subsequent use.

Audiphone Transmitter.

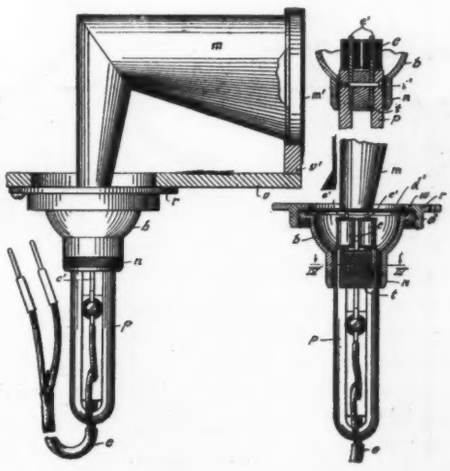
C. E. Williams, Chicago, 1,026,231, May 14, 1912.

An audiphone transmitter for deaf persons, is adapted to readily receive sound vibrations from the room and transmit them to the listener. The transmitter has a closed reverberatory chamber on one side of the carbon cup and an externally opening reverberatory chamber on the other side of the cup. A resonantor is provided having an open side and secured in operative relation to the externally opening chamber.

Signal Receiving Appliance.

J. G. Mitchell, Cleveland, Ohio, 1,027,351, May 21, 1912; assigned to North Electric Co., Cleveland.

A loud talking receiver is disclosed in which the posts of the electromagnet are adjustable toward and away from the main diaphragm *d*. The sound chamber which is formed by the element *b* it is claimed, augments the effect of the



sound. A magnetic diaphragm *d* is provided on the cover *b*. A sound chamber is formed between this diaphragm and the spacing member *w* and supplementary diaphragm *d'* superposed adjacent to the diaphragm *d*. The center of the supplemental diaphragm is perforated and the horn *n* is attached thereto at this opening.

From Factory and Salesroom

Conventions: Association of Railway Telegraph Superintendents, New York, June 4-7; Mississippi Independent Telephone Association, Meridian, June 25

The W. & M. Telephone Wire News.

The latest issue of the W. & M. Telephone Wire News published by the American Steel & Wire Co. contains a number of articles especially interesting to telephone construction men. An article on "River Crossings" tells how some notable crossings were constructed and the reason for the type of construction selected.

The use of motor cars for setting poles, stringing wire, pulling in cable in conduit, is described as are also the other uses to which a car may be put. Data is given regarding the cost of a one ton truck as compared with horse drawn equipment.

Another article describes the construction which is used for carrying telephone lines across railroad tracks. Specifications are given for either the underground or overhead crossing.

Some of the difficulties met within telephone constuction work are described in another article and the methods used to overcome them are given.

The method of guying with the use of a "dead man" anchor of concrete is the subject of the last article. Specific directions for molding the anchor in the earth in the spot where it is to be used, are given.

All the articles in this issue are illustrated with reproductions of photographs and diagrams.

The Bierce Cable Construction Specialties.

The Specialty Device Co., Cincinnati, Ohio, recently issued a new catalogue descriptive of the Bierce cable sleeve and cable roller for telephone and telegraph companies. The Bierce cable sleeve is designed to eliminate the necessity of making wiped joints or cable splices.

It is made in two main parts having gaskets at each end which, when the sleeve is placed in position are compressed, hermetically sealing the ends so that moisture cannot get into the splice. The entire sleeve is hot galvanized and all bolts and nuts are electrically sherardized.

In the application of this sleeve, no solder is used, one man is all that is needed to install it which is done by the tightening

The Bierce Cable Roller.

of eight bolts. The splice is readily accessible at all times, in case of accident, or if changes are to be made. It also provides a convenient testing station.

The sleeves are made in four styles, being straight solid sleeve, a straight split sleeve, a solid Y sleeve as shown in the illustration and a split Y sleeve. When the gasket at the ends of the sleeves are bolted in place, the gasket is under a high compression so as to be air tight under a 100 pounds hydraulic pressure. The material of the gasket being in a compressed box and hermetically sealed, is protected from the action of the elements and it is claimed will last practically forever.

Another specialty which has met with great success is the Bierce cable roller. The frame is made of forged steel and the roller of malleable iron, protected on both sides by pressed steel discs which insure the roller, as well as the cable, from injury. It also prevents the cable or rope from catching when being drawn through the roller.

The device may be easily removed from the messenger wire

The Bierce Cable Sleeve for a Y Splice.

and cable after the cable has been tied in position, by simply drawing the hinged member back. The cable roller is adaptable to all sizes of cable and its construction is so arranged as to allow it to hinge safely to the messenger wire before the clamp is tightened.

Other specialties described in the booklet are the Bierce pot heads and cable caps which utilize the principal used in the Bierce sleeve.

New Feature in Insurance Policies.

The Telephone Fire Insurance Exchange, of Cleveland, Ohio, which has been writing policies on Independent telephone exchanges, exclusively for more than two years, is introducing a new feature of special interest to telephone companies. It will write for any of its members, a contract which agrees in advance upon a fixed valuation covering switchboard and central office equipment and which obviates the necessity of appraising the property again before an adjustment is made, in case the property should be totally destroyed at any time during the life of the contract.

At the present time, when a total loss occurs, an adjustment is necessary, at which time the question is raised with reference to value of the property insured, the depreciation of the same, antiquation, and numerous other questions with reference to property that cannot be inspected at that time. In the past, a number of telephone companies have had serious trouble in adjusting such losses, and the new feature undoubtedly will be looked upon with favor by telephone companies.

The Telephone Fire Insurance Exchange's loss ratio for its entire history has been less than 25 per cent.

The Standard Pole Changer.

A practical, low-priced pole changer developed by Chas. R. Barrett, president of the Current Electric Co., Chicago, has enjoyed a steady sale ever since it was first brought out several years ago. With the newer and improved style, this demand has materially increased.

Mr. Barrett is an inventor of ability in lines other than telephonic. Among the articles developed and manufactured by him are the Barrett automatic spring coiling machines which will automatically coil both extension and compression springs; square the ends of any compression springs and cut them accurately to any desired length very rapidly at a slight expense over the bare cost of the wire; the automatic rotary looping machines will loop springs as fast as they can be handled by the most expert operator.

(Continued on page 42, Advertising Section.)